

AMERICAN

MAY 1943

FORESTS



**SPECIAL NUMBER -
THE DOUGLAS FIR REGION**

35 CENTS
A COPY

He can smile through it all



So let's keep a smile a-going back here, too.

Even though war is crowding the wires, telephone people still want to give you pleasant, friendly service. Materials for new telephone facilities are not to be had. But there's no shortage of patience and understanding.

Takes a lot of pulling together to do this and we appreciate the help from your end of the line.

BELL TELEPHONE SYSTEM



WAR CALLS COME FIRST

• Your continued help in making only vital calls to war-busy centers is more and more essential every day.

AMERICAN FORESTS

VOLUME 49

MAY, 1943

NUMBER 5

Editor

OVID BUTLER

Associate Editors

LILIAN CROMELIN

ERLE KAUFFMAN

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American Forests

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THE
AMERICAN FORESTRY
ASSOCIATION

919 Seventeenth Street
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The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of its magazine—*AMERICAN FORESTS*—designed to keep before the people of the country important conservation questions and issues, the Association carries on educational work in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

The Association is independent and non-commercial, and has no connection with any federal or state governments. Its resources and income are devoted to the advancement of conservation in the interests of public welfare, and all citizens are welcomed to membership.

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The Forest Exchange

AFA Forest Study Draws Favorable Comment

Official reaction to The American Forestry Association's three-year project to appraise, critically and impartially, the forest situation, with particular reference to its changing status under war conditions (fully set forth in the April issue of AMERICAN FORESTS), is reflected in the following excerpts from letters received up to April 1:

"The forest resources of this country are vitally important and I am glad that studies are being undertaken now with a view of outlining plans for post-war reconstruction. The problem is a serious one and must be handled intelligently, and I am sure that the assistance rendered by the Association will be greatly appreciated. You may be sure that I shall be most happy to cooperate."—*Governor Sam C. Ford* of Montana.

"The project, if effectively carried out, will provide a factual foundation for the formulation of a sound forest policy for the nation and can conceivably result in dispelling some of the misinformation which now clouds the situation. In view of the fact that the Department of the Interior is vitally interested in forest conservation, both the Department and its bureaus and agencies concerned with the practice of forestry will be pleased to render every possible assistance."—*Lee Muck*, Assistant to the Secretary in Charge of Land Utilization, Department of the Interior.

"Changing conditions make information fairly authentic several years ago to be much less so now. There is lack of fundamental information within a single state or even part of a state as to forest resources, conditions, etc. We do not know the potentialities of wood utilization after the war. Yours is a magnificent undertaking."—*John H. Foster*, State Forester of New Hampshire.

"I fully agree with you as to the great importance of a better understanding of our forest situation by the general public. I hardly need assure you that, as in the past, we shall be glad to make available for your use what data and information we have pertaining to the subject."—*Lyle F. Watts*, Chief, Forest Service, Department of Agriculture.

"The outline for a study of forest conditions as affected by the war was considered by the Forest Conservation Committee and by the Executive Committee of the National Lumber Manufacturers Association during the recent

meetings in Chicago. As a result, on March 13, the Executive Committee approved the following resolution:

"The National Lumber Manufacturers Association endorses as a constructive undertaking a study of forest conditions as affected by the war as proposed by The American Forestry Association."—*Wilson Compton*, Secretary-Manager, National Lumber Manufacturers Association.

"I am delighted to know that The American Forestry Association proposes to undertake such a study. The Soil Conservation Service will be glad to give any available assistance."—*H. H. Bennett*, Director, Soil Conservation Service, Department of Agriculture.

"I think such a study is most essential and should be pleased to cooperate in any effort along this line."—*Governor Arthur B. Langlie* of Washington.

"The project appears to be very much worth while, especially since no single agency has attempted to furnish the proposed information. Certainly, knowledge of our forest condition is of utmost importance for present and future planning. You have my assurance of full cooperation."—*M. B. Pratt*, State Forester of California.

"The Association is to be congratulated on the development of a long range plan that should be productive of information vital to the best interests of every American. You may be sure that the Fish and Wildlife Service will be happy to cooperate."—*Ira N. Gabrielson*, Director, Fish and Wildlife Service, Department of the Interior.


"I am glad to endorse the program proposed by The American Forestry Association for the study of forest conditions as affected by the war. I can assure you of the wholehearted cooperation of any New Jersey state agency that may be of help in carrying on this study."—*Governor Charles Edison* of New Jersey.

"I want to commend the Association on its initiative and foresight. I will be glad to assist you in every way possible."—*N. S. Rogers*, State Forester of Oregon.

"I wish to express my wholehearted approval of the work that you propose to do concerning the economic problems that will be affected by the wartime pressure on our forest and agricultural lands."—*Governor Dwight H. Green* of Illinois.

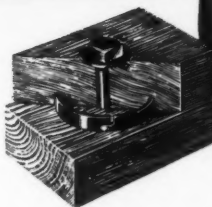
FREEDOM IS NOT FREE~IT IS PRICELESS ~ BUY WAR BONDS

SELECTED FOR SERVICE



Topping the "spar tree" preparatory to forestry operations. Selective harvesting of fully matured trees in the surrounding forest will assure continued forest growth.

The **TECO** Ring Connector spreads the load on a timber joint over practically the entire cross-section of the wood . . . brings the full structural strength of lumber into play.

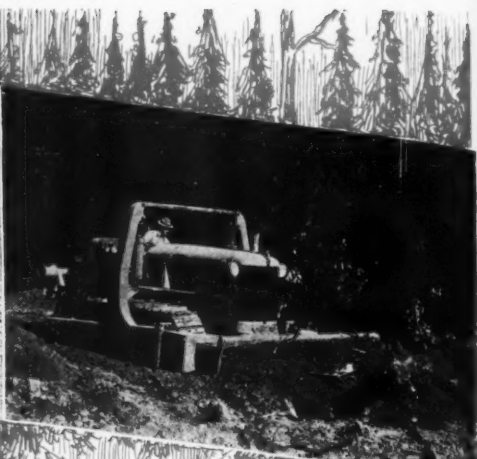
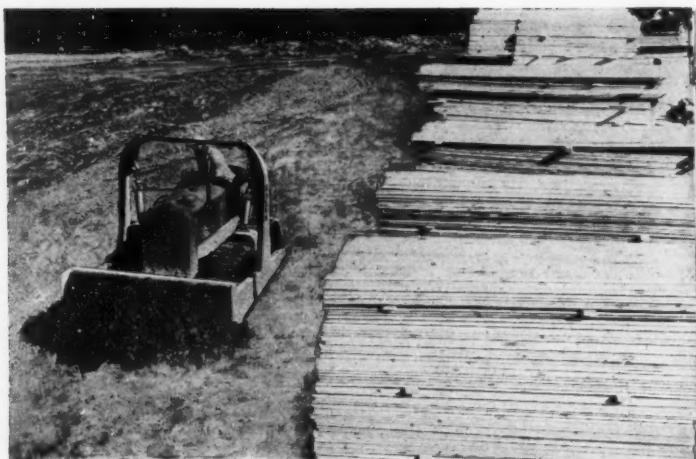


TIMBER ENGINEERING COMPANY
NATIONAL MANUFACTURERS OF **TECO** TIMBER CONNECTORS AND TOOLS
WASHINGTON, D. C. PORTLAND, OREGON

Lumber, in a thousand different forms, streams to the fighting fronts of the world. At home, wood replaces metal in thousands of heavy duty war structures—made possible by the **TECO** Connector System of Timber Engineering. This **FREE** Reference Book shows details of 45 typical timber designs for roof trusses, bridges, towers, tanks, hangars, and other structures for the war today and the peace tomorrow. Available to practicing engineers and architects. Write for it today—using your firm letterhead.



WOOD GOES TO WAR — An MGM Technicolor short by James A. Fitzpatrick. Ask your theater when you can see it.



Baker Hydraulic Bulldozers Boost Board Footage!

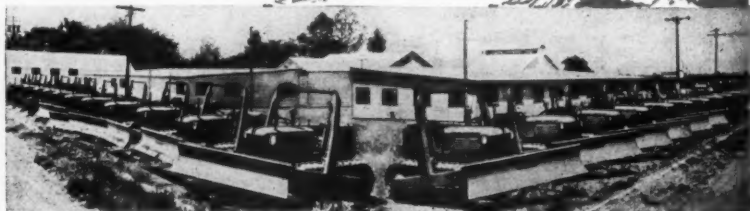
Besides all of its normal uses, lumber is "pinch-hitting" for steel in building construction, ship hulls, aircraft material and scores of other war-time uses. Anything that helps get trees to the mill faster and cheaper is helping the war effort. And that's where Bakers come in. Lumbering operations using them have found these five Baker features cut costs and save time in the woods and at the mill:

- (1) Direct lift and full down-pressure. Blade does not depend on its own weight to "bite in." This is important when going is tough or when top soil is frozen.
- (2) No costly, hard-to-get cable to replace or maintain. No complicated reaving. No power loss through linkage levers—just two simple vertical hydraulic cylinders. Hydraulic system operates smoothly in any weather.
- (3) Equalizing action of cylinders keeps moldboard level on rough ground, independent of crawler action, no by-passing of dirt under corner of blade.
- (4) Bulldozer is interchangeable with Baker Gradebuilder — change-over made in a matter of minutes.
- (5) Overhead tie-bar protects operator against falling trees or in the event of a spill.

A book, "Unsung Heroes of War," sent on request, shows Bakers in the woods, in mines, quarries and on construction projects—all essential to insure Victory! Tells how Baker engineers originated the first hydraulic bulldozer.

Left: Baker leveling ground for dressed and matched stock pile. Above: a Gradebuilder on the front end and a snagging winch on the back end makes this a handy unit.

Twenty-five Baker Gradebuilders used to fight fires by the California Division of Forestry, greatly reduce the menace of Jap incendiary bombs. Bakers are helping the lumber industry many ways.



THE BAKER MANUFACTURING CO.

533 Stanford Ave., Springfield, Ill.

BAKER

The Modern Tractor Equipment Line
for
EARTH MOVING
LEVELING AND GRADE BUILDING
SNOW REMOVAL
ROAD MAINTENANCE



*First come
LOGS!*

A supply of logs exceeding anything yet seen is the logging industry's answer to the urgent wartime demand for wood and more wood. It's your work and sweat and planning to get 'em out faster and faster that's helping to launch more ships, put more planes in the sky, more tanks and guns on the front lines, more products of all kinds in the hands of the Armed Forces and more goods on the shelves for civilian consumption! It's a big job and it's being done in a hurry, the American way . . . with modern fast-moving tractors. Tractors like the Allis-Chalmers 2-Cycle Diesel that knows no quitting time . . . that has steam-like power for quickly hauling heavy loads through tough going — bringing out the forest giants from inaccessible areas without injuring new growth and yarding more loads per shift! These outfits are playing a big part in every phase of the war, at home and on the

front lines. That's why Uncle Sam asks you to keep them properly serviced — make 'em last! Take care of your tractors and you'll take care of your production. Your Allis-Chalmers dealer will gladly cooperate with you in every way. Let him help you!

ALLIS-CHALMERS 2-CYCLE DIESEL TRACTORS
 3 SIZES: HD-14, HD-10, HD-7
 TRACTOR DIVISION — MILWAUKEE, WIS., U.S.A. 54 TO 132 DRAWBAR H. P.

NEW FORESTS FOR OLD



A FIFTY-THOUSAND ACRE TREE FARM IN WESTERN WASHINGTON

The Pacific Northwest is shipping about 6,000 carloads of lumber every week to the shipyards, airplane factories, war construction in the United States and ports where cargoes move to fighting fronts overseas.

The Region has 1,100 sawmills and 600 billion feet of virgin timber. But it also has 7,500,000 acres of Junior Douglas Fir. Its young forests spread as more operations follow the industry's code of Forest Practice and the control of forest fires becomes more complete.

The Pacific Northwest is putting its best timber into the war—and growing still more for the future needs of Peace.

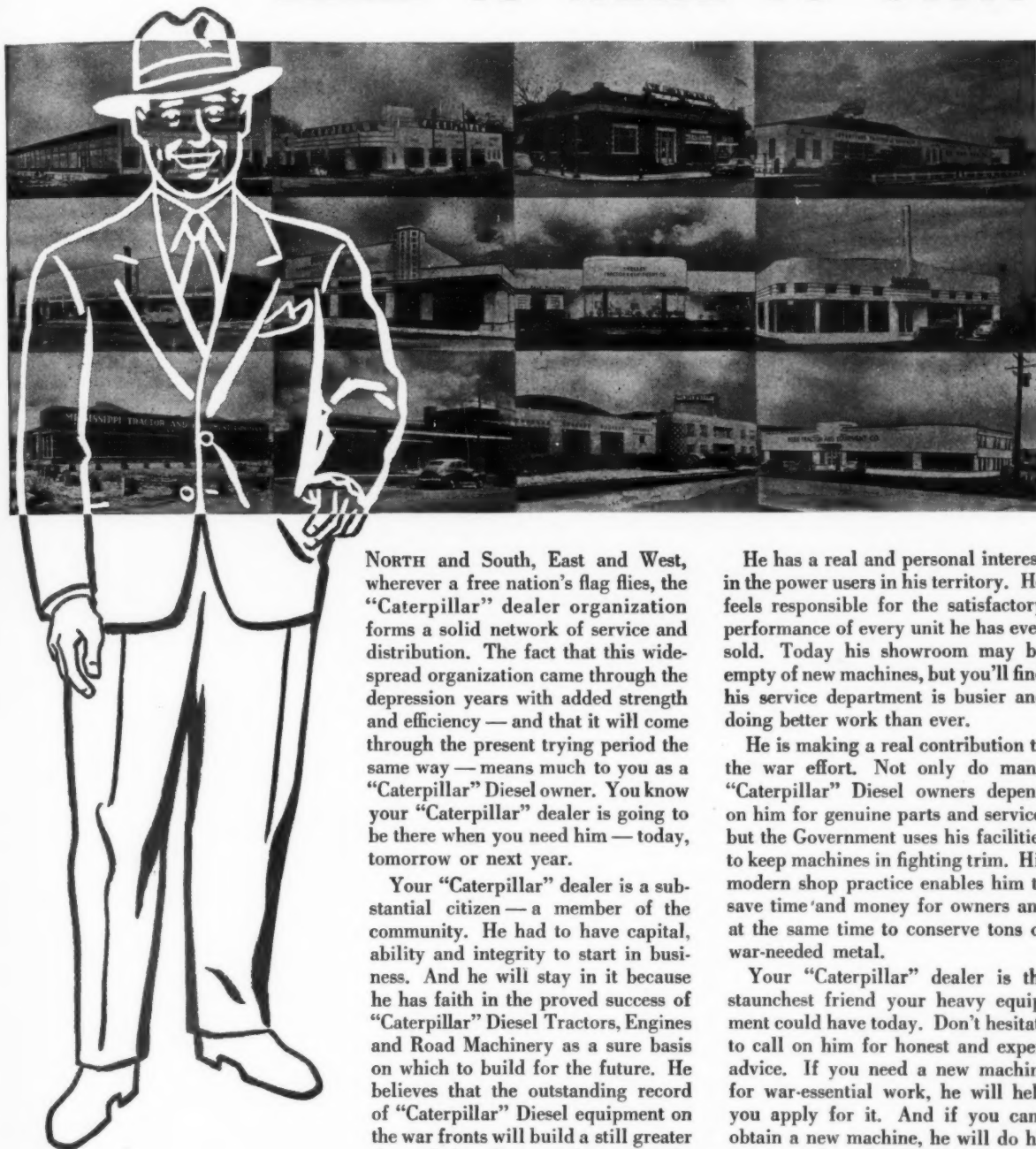
DOUGLAS FIR — SITKA SPRUCE,
PORT ORFORD CEDAR

WEST COAST HEMLOCK
WESTERN RED CEDAR

WEST COAST LUMBERMEN'S ASSOCIATION

AMERICA'S PERMANENT LUMBER SUPPLY

YOUR "CATERPILLAR" DEALER IS HERE TO STAY



NORTH and South, East and West, wherever a free nation's flag flies, the "Caterpillar" dealer organization forms a solid network of service and distribution. The fact that this widespread organization came through the depression years with added strength and efficiency — and that it will come through the present trying period the same way — means much to you as a "Caterpillar" Diesel owner. You know your "Caterpillar" dealer is going to be there when you need him — today, tomorrow or next year.

Your "Caterpillar" dealer is a substantial citizen — a member of the community. He had to have capital, ability and integrity to start in business. And he will stay in it because he has faith in the proved success of "Caterpillar" Diesel Tractors, Engines and Road Machinery as a sure basis on which to build for the future. He believes that the outstanding record of "Caterpillar" Diesel equipment on the war fronts will build a still greater demand for these machines for the heavy jobs of reconstruction and peace.

He has a real and personal interest in the power users in his territory. He feels responsible for the satisfactory performance of every unit he has ever sold. Today his showroom may be empty of new machines, but you'll find his service department is busier and doing better work than ever.

He is making a real contribution to the war effort. Not only do many "Caterpillar" Diesel owners depend on him for genuine parts and service, but the Government uses his facilities to keep machines in fighting trim. His modern shop practice enables him to save time and money for owners and at the same time to conserve tons of war-needed metal.

Your "Caterpillar" dealer is the staunchest friend your heavy equipment could have today. Don't hesitate to call on him for honest and expert advice. If you need a new machine for war-essential work, he will help you apply for it. And if you can't obtain a new machine, he will do his utmost to keep your old equipment in running order.

CATERPILLAR DIESEL

REG. U. S. PAT. OFF.
CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

TO WIN THE WAR: WORK—FIGHT—BUY U. S. WAR BONDS!

THE EDITOR'S LOG

Special Number

This issue of AMERICAN FORESTS is devoted almost exclusively to a forested corner of the United States commonly known as the Douglas fir region of the Pacific Northwest. In point of area the region is not great when compared to the broad expanse of land lying between our two oceans. But in point of forests and what is going on in them, it is a vital scene in the current drama of American forestry.

There is the clatter and strain of war in the great forests. And back of that there is something more, for out of the soil into which the giant trees have sunk their roots, a figure has arisen—a man born with hobnail boots on. He is walking the woods, pulling himself up by his own boot straps. His name is INDUSTRIAL FORESTRY. To him, to what he has accomplished and is endeavoring to accomplish, this issue is dedicated.

In it, the editors have endeavored to present a series of articles that give a fair cross-section of the good rather than the bad side of the forest picture in the Pacific Northwest. There is, of course, a bad side in point of scenes of reckless cutting and great fire scars on the forest landscape. But the thing today that is vital, significant and full of promise for the future is the broad growth of industrial forestry that is stemming up from the soil right under the trees, nurtured by men who for the most part are sons of lumbermen—a new and young generation of American woodsmen. From their own experiences and from those of their fathers, they are step by step striving to evolve a type of private forest enterprise that will keep the forests growing and at the same time meet the practical test of a yearly balance sheet. And that, incidentally, is the only type of private forestry that will succeed and endure and will keep people permanently employed.

These men, their co-workers and their foresters deserve public recognition. AMERICAN FORESTS is glad to help make their good works known.

Fighting Forests

"Our Trees Are Fighting Too" is the slogan on The American Forestry Association's new 1943 poster stamp now available (see page 270). The painting from which the stamps have been reproduced was done es-

pecially for the Association by Leslie Ragan, well known poster artist of New York. Printed in four colors the stamps carry the full slogan "Our Trees Are Fighting Too — Prevent Forest Fires." In the scene portrayed there is no semblance of fires or burnt and blackened forests — elements of awfulness which most foresters have always felt necessary in a poster to shame, shock and frighten people into doing something about the forest fire menace.

This year's poster reverses that technique. It is based on the belief that people respond more cheerfully and wholeheartedly to inspirational appeals than to depressing ones. Central figure in the poster is a typical American youth—he might be your boy or mine—equipped for the fighting line. Back of him is a typical scene of American beauty and grandeur across the face of which is a great sweep of green forests. They are fighting forests, sending their best specimens of treehood to war to help our best specimens of manhood bleed victory out of battle. Together in common strength they are ready for the common foe.

Out of the over-all scene leaps the thought that we stay-at-homes—many of us feeling all too useless—can help our trees help our boys by spreading the word of forest fire prevention. These poster stamps if used on every letter we mail this summer may be instrumental in saving forests whose wood is urgently needed to carry great packets of food, medicine and equipment to our fighting boys in the Solomons or North Africa. There is always the chance. And the effort on the part of us stay-at-homes is so very, very small.

War Lumber Outlook

The present outlook for lumber with which to meet war needs during 1943 is not good. The situation at this writing has decidedly critical tones. Early in the year 1943 military needs were estimated at thirty-two billion feet. Now there is talk of a need for thirty-five billion feet. So far this year production has proceeded at a yearly rate of only twenty-six billion feet—a lag that threatens a production shortage equal to that of 1942.

Eight months remain in which to overcome the current production

drag. Can the industry do it? However you look at it, the task looms as the greatest production challenge ever faced by the lumbermen of America. Given a reasonable allowance of manpower—main bottleneck in the lumber stream—the industry believes the race can be won. But the breaks will have to be on the favorable side—good logging weather, absence of disruption by forest fires, prompt delivery of equipment replacements, speedy building of roads to isolated timber.

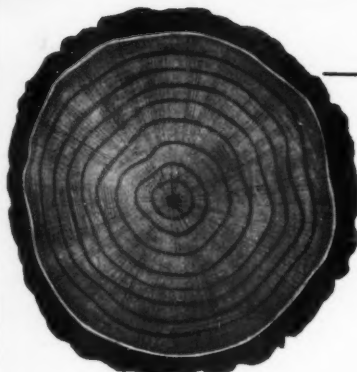
That the government is alarmed over the outlook is evidenced by the fact that early in April the War Manpower Commission issued another order directed to the Pacific Northwest designed to hold men on their jobs in the woods and at the mills, and to return to lumber work several thousand experienced woodsmen who have been drawn into war industries.

Forest Fire Outlook

Coupled with an overcast outlook for lumber production is an overcast sky on the forest fire horizon. Out of this overcast may come shafts of fire to wreck lumber production in many areas. Forest fires, as all informed persons know, can unexpectedly do just such things.

The fire outlook is more unpredictable than lumber production. The only time it is safe to make predictions about forest fires is when a community, state or nation is well prepared to deal with them. Even then predictions are uncertain because forest fire is as unpredictable as the weather, the Japs or the German fox, Rommel. As the situation now stands, adequate preparedness for 1943 forest fires is not in sight nor are prospects encouraging that it will be, if one may judge by the current attitude of the House Committee on Appropriations.

This federal purse-string committee appears to hold that here is a good place to save a few million dollars by taking a chance that forest fires will not be as bad as last year. In any event it has recommended that the Department's fire-fighting allotment for the year beginning July next be some \$5,000,000 less than was made available for the fiscal year now drawing to a close. Its position appears to be that if the prevention of forest fire is, as the Department



and the states claim, a threat to vital war points, additional funds should be provided by the War Department.

The Army fortunately has indicated a willingness to make available \$2,800,000 for coastal areas, but this still leaves federal and state protection of interior forests three million dollars short of funds they have had this year. Add to this an increased shortage of local voluntary help in combatting forest fire plus a reduction of trained fire fighters and you get an answer like that of the cowboy who in the course of an examination to become a forest ranger came to the question—"In case of forest fire, what would you do?" His answer was—"Pray for rain and run like hell."

At all times prayer is good but in time of war there is no running for the victor. We must face the unpredictable enemy *forest fire* with the same measure of preparedness we provide against our other enemies. There is little likelihood that the House of Representatives will overrule its Committee on Appropriations. The one last hope is now with the Senate, which last year stepped into a similar breach and met the emergency with dollar and cent preparedness. So, write your Senator and say it with strong words—not with flowers.

Trees in War and Peace

Secretary of Agriculture Claude R. Wickard wrote some good lines last month in a press release commending the observance of Arbor Day. Said the Secretary:

"Today more than ever, we have need to appreciate our trees. Trees from America's forests are going to war along with our fighting men, furnishing the vast quantities of wood needed for ships and planes, for cantonments, factories and docks, for boxing and crating of war materials, for railroad ties and telephone poles to keep wartime transportation and

communication going, and for hundreds of other uses essential to our war job.

"Wood from America's forests is essential to the wartime food program. An inadequate supply of lumber for farm buildings, equipment, and storage facilities might seriously hamper our meeting food production goals.

"And when the war is won, trees will be needed to help rebuild a war-torn world and to move forward in the way of peace.

"In this country, we have been too much inclined to plant a tree and waste a forest. If we are to maintain a strong and free America, we must look beyond the tree in the front yard to the trees on the hills; we must see the trees of our forests as a basic resource indispensable to the life of the nation.

"Sooner or later we shall have to plant trees on millions of acres of once productive forest land which we have allowed to become denuded if these lands are not to be carried as dead weight in the national economy. More important still, we must take steps to make sure that wasteful cutting practices in our remaining forests do not add more millions of acres of waste land. Forests can be managed so that they will continue productive without replanting. Through the practice of scientific forestry, it is possible to have our forests yield successive crops of timber without exhaustion, to keep our forests perpetually productive.

"It is my hope that Arbor Day observances this year will be marked by a new nation-wide determination to see that our trees and forests are safeguarded against waste and misuse; that real forest conservation is achieved in the United States."

Monument to Morton

Spring observance of Arbor Day throughout the United States always brings with it the name of the man from whose active and public-spirited mind first came the idea of setting apart a day each year for the planting of trees. The name of J. Sterling Morton is now so well known as hardly to need writing. Mr. Morton first propounded his idea at a meeting of the Nebraska Board of Agriculture on January 4, 1872. He probably never expected it to spread

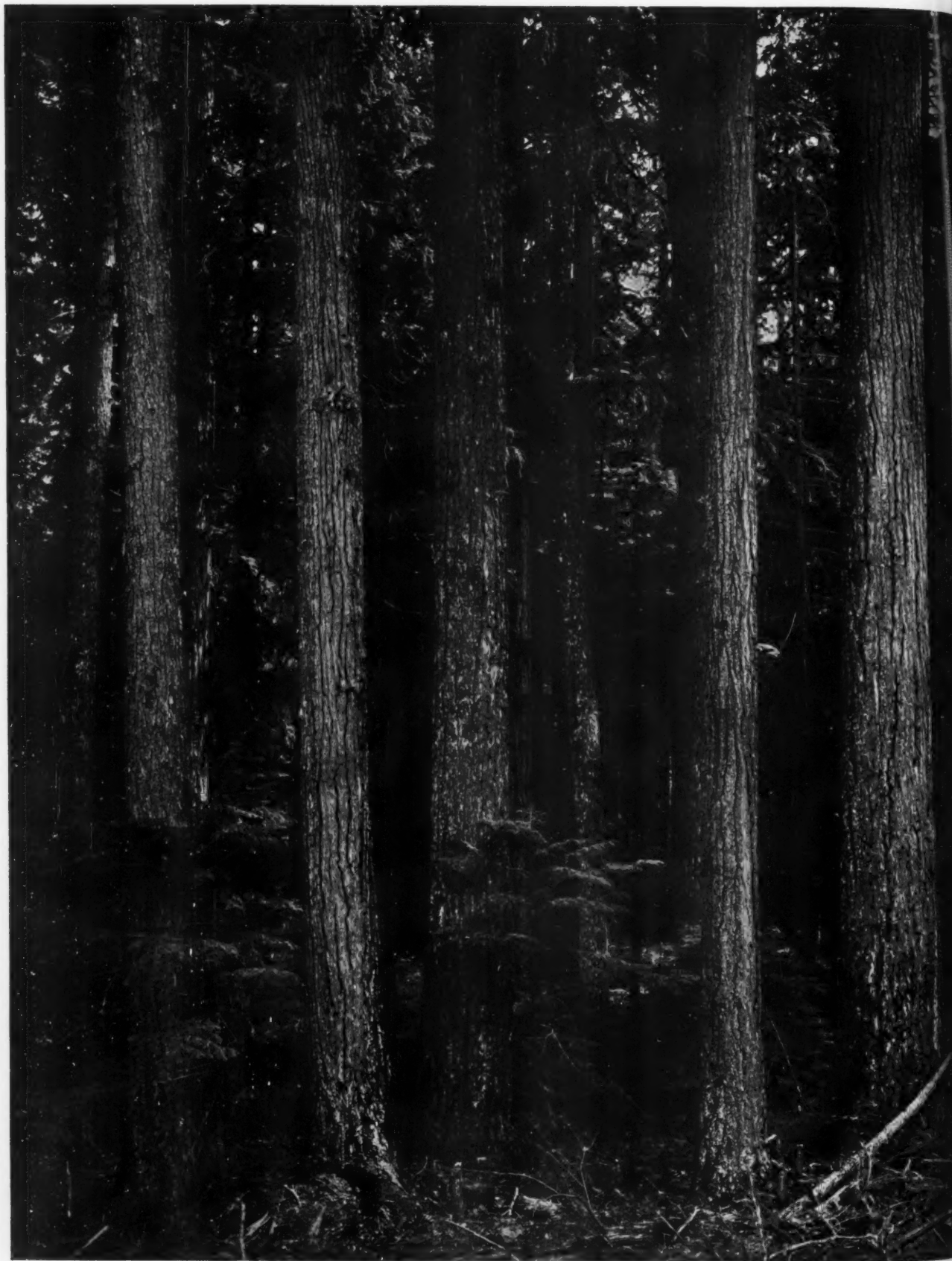
to far corners of the union and to some foreign countries. At the time, he was thinking mainly of his own treeless State of Nebraska in which he had been a ceaseless and indefatigable advocate of the planting of fruit and shade trees. He himself wrote the resolution which was unanimously adopted by the Board, naming the date of April 10 to be "especially set apart and consecrated for tree planting in the State of Nebraska."

So it followed that the first "Arbor Day" was observed by the State of Nebraska on April 10, 1872. On that day, there appeared in the *Omaha Daily Herald* a brief article written by Mr. Morton in appreciation of trees. One paragraph read: "A collection of inanimate marbles may, for a few years, preserve the name, and entry, and exit on this stage in life's short play. But how much more enduring are the animate trees of our own planting. They grow and self-perpetuate themselves, and shed yearly blessings on our race. Trees are the monuments I would have and in their yearly tribute of emerald foliage, variegated flowers and blushing fruit, I would find my most acceptable panegyric."

This year J. Sterling Morton's wish for trees as his monument has been fulfilled in a form that would have given him everlasting joy and pride could he have lived to bear it witness. The Save-the-Redwoods League has announced that a grove of stately redwoods in northwestern California has been set apart to be preserved in honor of the founder of Arbor Day. Known as the Morton Memorial Redwood Grove, it is in Humboldt Redwoods State Park in the area of the Avenue of the Giants. Its establishment was made possible through a gift by Mr. Sterling Morton, Mr. Mark Morton and Mrs. Jean Morton Cudahy, of Chicago, and Mrs. Caroline Morton of New York.

Mr. Morton is remembered mainly as founder of Arbor Day. Those who would know his full stature as a man, pioneer and patriot should read a book just off the University of Nebraska Press titled "J. Sterling Morton." It is the first full-length biography that has been written of him.

Orin Foster



FORESTS OF THE DOUGLAS FIR REGION

By E. H. MacDANIELS

BETWEEN the crest of the Cascade Range and the Pacific Ocean in western Oregon and Washington lies a section of the country teeming with typical American life—cities, towns, industries, farms, railroads, ships, people—all taut with today's task of winning the war. It is perhaps not strictly accurate to use the word "typical" because in this region more than any other in the United States, the back-logs of human activities are the forests that carpet the mountain slopes as they fall away and level out to the ocean.

Here is the home range of the giant Douglas fir, dominating tree in great forests of spruce, hemlock and other softwoods. In these forests, there likewise is teeming life—big timber noisily going to war, small trees quietly growing for the future. Altogether they form the greatest empire of concentrated wood remaining in the United States.

People of the region like to startle the rest of the country by saying that enough Douglas fir sawtimber is standing in their forests to rebuild every residence in the United States. If questioned they can substantiate their statement with government figures and can have some twenty billion feet left over. They like to think that the old Paul Bunyan yarn about the operator who logged a forty-acre tract, ran the logs through a saw-mill and had to buy more land to pile the lumber on, originated here.

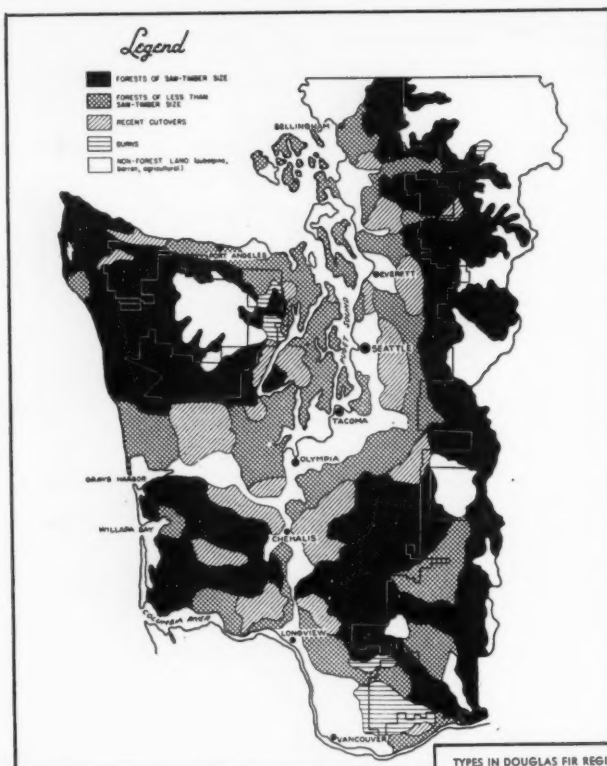
In terms of the nation's total land area, the breadth and scope of the Douglas fir region is not impressive. It embraces a strip of country of some thirty-five million acres extending from Northern California northward 480 miles with a width varying from 100 to 150 miles. No one knows how much standing wood nature had packed into this limited area prior to the coming of the white man. No one knows how much has since been cut or exactly how much has been destroyed by great forest fires, the like of which very few people living outside the area have ever seen. But despite past drains upon the forests, the region today contains a third of the na-

tion's remaining supply of sawtimber and its mills are supplying from a fourth to a third of the country's requirements for lumber, a fourth of its pulp and ninety per cent of its shingles. It is no exaggeration to say that without these forests the country would be on a short allowance of building material and of special quality wood to meet present war requirements.

Government estimates based on an intensive land and timber survey by the U. S. Forest Service credit the region with 546 billion board feet of sawtimber, sixty percent of which is Douglas fir. Next most important species is western hemlock, followed by western red cedar and Sitka spruce. From these three species come ninety-five percent of the region's annual cut, of which Douglas fir furnishes over three-fourths. Intermingled with these trees are numerous other species of lesser present commercial value, for a kindly climate has bestowed upon the region not only extensive forests but forests of dense and luxuriant growth. And time has reared a mixed race of forest giants and lesser tree-folk.

Important species commonly associated with Douglas fir (*Pseudotsuga taxifolia*) are western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), Sitka spruce (*Picea sitchensis*), Pacific silver fir (*Abies amabilis*), and noble fir (*A. nobilis*). Exceptions to the predominance of Douglas fir are found in the forests on the cool, humid western slopes of the Coast Ranges and the Olympic Mountains known as the fog belt, where western hemlock and Sitka spruce are the outstanding species and Douglas fir is occasionally entirely lacking.

Of the region's total land area of thirty-five million acres, slightly over twenty-six million are classed as commercial forest lands. Another two to three million acres support non-commercial forests of one sort and another. About one-half the area of commercial timber lands now contains trees of saw-log size. For the region as a whole the



Forest types of Washington

various types of forest growth are shown in the graphs and the table on this page and the graph on the opposite page. The best one-third of the region's forest lands are found in the Coastal Range and on the lower slopes of the Cascades north of the Cowlitz River in Washington. Here is half the region's timber growing capacity. Hardwood forests there are but they are much limited, occupying only about three percent of the forest area. Their trees of chief importance are red alder, bigleaf maple, California laurel, northern black cottonwood and Oregon ash.

Between forty and fifty thousand owners hold the forest land in the two states, more than half of them in the Douglas fir region. The lands are about evenly divided between public and private ownership.

The following table gives broad classes of ownership in the Douglas fir region with approximate acreages held:

Owners	Acre
Private	14,654,000
State	967,000
County	630,000
Municipal	101,000
Federally owned or managed:	
Indian Lands	260,000
Revested Land Grants	2,115,000
National Forests	9,498,000
Other federal lands	775,000
Total	29,000,000

Ninety percent of the lumbering in the region has been in the privately owned and more accessible forests; most of the remainder in national forests, Indian reservations and in re-

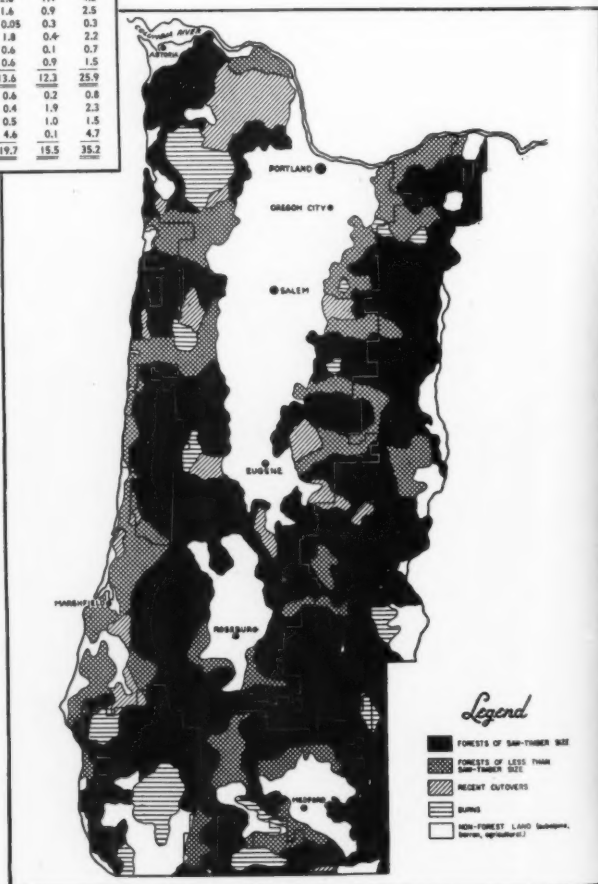
vested O and C land grants. Cutting on the latter group of holdings is under the control of federal foresters and is done under methods looking to sustained yield. Operations on private lands vary according to ownership and policies of individual owners. In both Oregon and Washington certain state restrictions apply to protection of the resource and to operating practices. The former state recently sharpened its restrictions by passing a cutting control act, and since the NRA Lumber Code of 1933 the Douglas fir industry has been following self-established code practices.

Of the twenty-six million acres of commercial forests in the region the timber survey of 1933 showed that about fourteen and a half million acres at that time contained coniferous timber of saw-log size; four million acres of timber smaller than saw-log size; three million acres of seedling and sapling growth and about three and a half million acres of burned and recently cutover lands. Since the survey was made an estimated one and a half million acres have been logged. A re-survey of thirteen counties in Washington and six in Oregon four to seven years after the survey showed a gain of 980,200 acres of immature conifers. On the basis of this showing it seems safe to say that restocking for the region as a whole is at least keeping up with logging. Perhaps a million acres will require artificial planting. Both industry and the government have tree nurseries aggregating an annual capacity of over ten million trees with which to meet planting needs.

What of the drain upon these forests? Over the past nine years lumbering, forest fires, insects, wind and old age re-

TYPES IN DOUGLAS FIR REGION	Millions of Acres (1933)
	Private Other Total
Conifer Sawlogs	6.2 8.3 14.5
Conifer Timber, smaller than sawlogs	2.8 1.4 4.2
" " seedlings & saplings	1.6 0.9 2.5
" " small mixed types	0.25 0.3 0.55
Recent Cutovers	1.9 0.6 2.5
Old Cutovers—not restocked	0.6 0.1 0.7
Burns, not restocked	0.6 0.9 1.5
Total Commercial Conifers	13.6 12.3 25.9
Hardwood Timber	0.6 0.2 0.8
Non-commercial Forest	0.4 1.9 2.3
Non-forest (rocky, barren)	0.5 1.0 1.5
Agricultural	4.8 0.1 4.9
Total Land Area	19.7 15.5 35.2

Forest types of Oregon

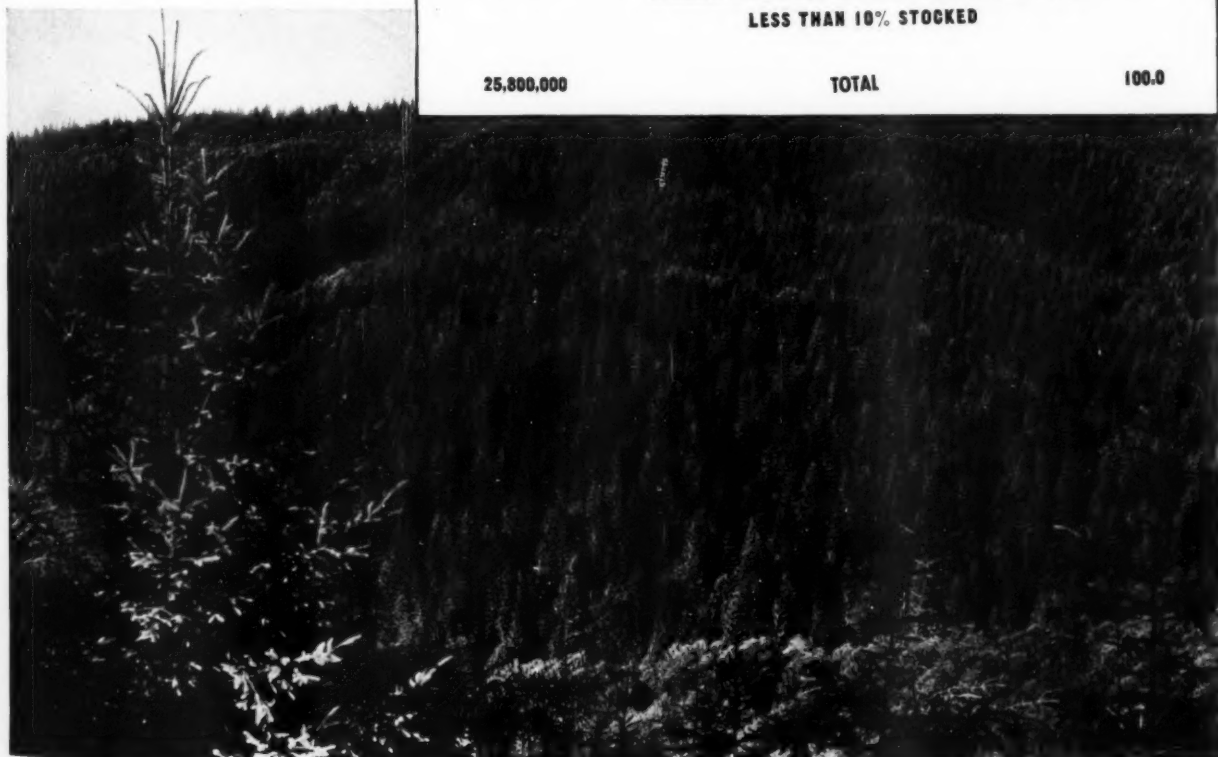
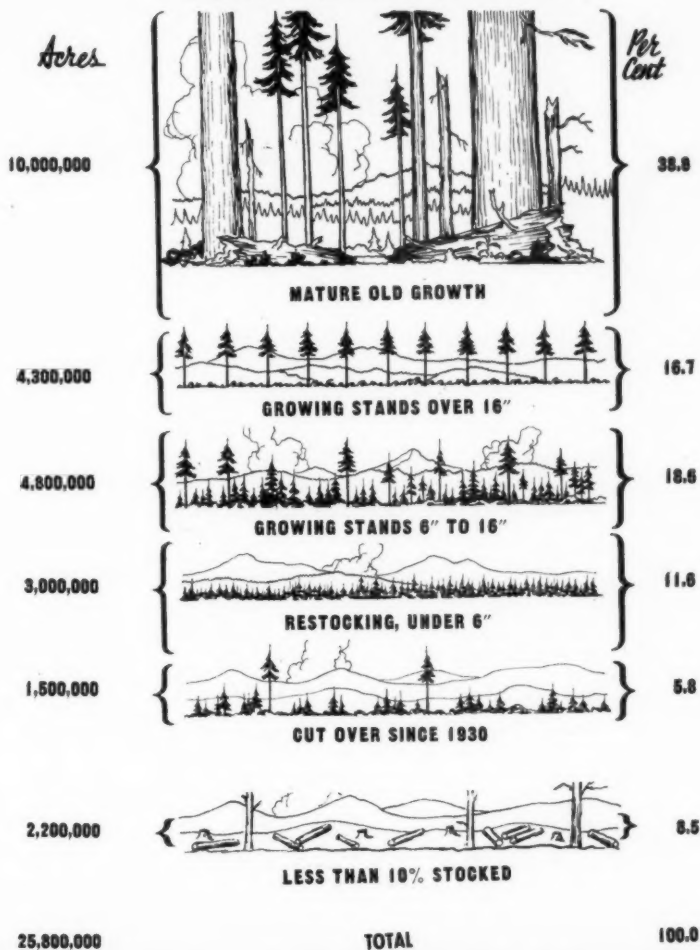


moved an average of eight billion board feet yearly. During the last two years cutting has increased due to the emergency need for wood in prosecuting the war. Last year, for example, it is estimated that the annual cut for the region was close to nine billion feet. The bulk of the cutting has been in the old-growth Douglas fir. These are the forests of "big timber," the best of which yield 175,000 feet and more an acre. By and large, the annual take of wood from the forests of the region is less than two percent of the supply.

Against this depletion, there should be balanced the growth that is taking place annually in the uncut forests. Of the thirteen to fourteen million acres bearing trees of saw-log size the net growth is not great because in mature forests decay and mortality tend to cancel growth. As the mature forests are cut and replaced by young fast-growing trees, however, the regional growth rate increases. At the time of the 1933 Forest Survey the forests of the region were growing at a yearly rate of 4.7 billion feet. It was further estimated that if everything—depletion, restocking, protection, logging practice and utilization—continued at the 1933 level, growth during the decade 1943-52 would be 5.7 billion feet annually, 6.2 billion feet annually in the next decade and 7.4 billion feet annually when the entire area is in young forests.

(Turn to page 264)

COMMERCIAL FOREST AREAS TIMBER TYPES IN THE DOUGLAS FIR REGION



MAY, 1943

THE FORESTS' ROLE IN VICTORY

By JAMES STEVENS

JOSEPH E. Davies, former Ambassador to Russia, said, in a nation-wide broadcast, that Hitler might be dead. Anyhow, it was left to Goering to dispel the gloom from the German dust bowl of war hopes with the oration of the day, on the recent Nazi anniversary. The big wind was hushed even as it began to blow. Bombs fell on Berlin.

The smash stories on front pages throughout the country led off with the news that the raiders were Mosquito bombers, Britain's latest and fastest egg-laying flyers, and said they were made of wood. Plywood skins on spruce frames. "No speed-reducing rivet bumps." Over Berlin at 400 miles an hour, while Goering fled from the microphones to a hole in the ground. Later the Mosquitos returned, to perform a bombing obligato for Goebbels' shrill tenor solo. A nice little job for wood from the North Pacific Coast.

The Office of War Information put forth a statement that cited the loggers of the Douglas fir region as "ground crews for the Royal Air Force."

In the last quarter of 1942, production of aircraft woods by West Coast mills increased nearly five-fold over production for the April-June period of the year, according to Fred Brundage, War Production Board western log and lumber administrator. This great demand continues, and it is being met with four outstanding West Coast species—Douglas fir, West Coast hemlock, Sitka spruce and noble fir.

When the full story of General MacArthur's great Papuan campaign can be told, another drama of West Coast woods at war in the air will be on the stage at the opening curtain. Gliders and transports speeded MacArthur's men over the peaks and jungle gorges of the Owen Stanley Mountains to start that victory drive. It has been described as a greater movement of troops by air than that of the Germans on Crete.

Men of Oregon and Washington were in the New Guinea attack flights. The

41st, cited by MacArthur, is a division made up mainly of Oregon and Washington National Guard units. Wood from the home forests has gone to war with them—first with the convoys, then from Australian ports to camps, to advanced bases, through the air, and now up the Papuan coast. The products of the forest front in the homeland are with them all the way.

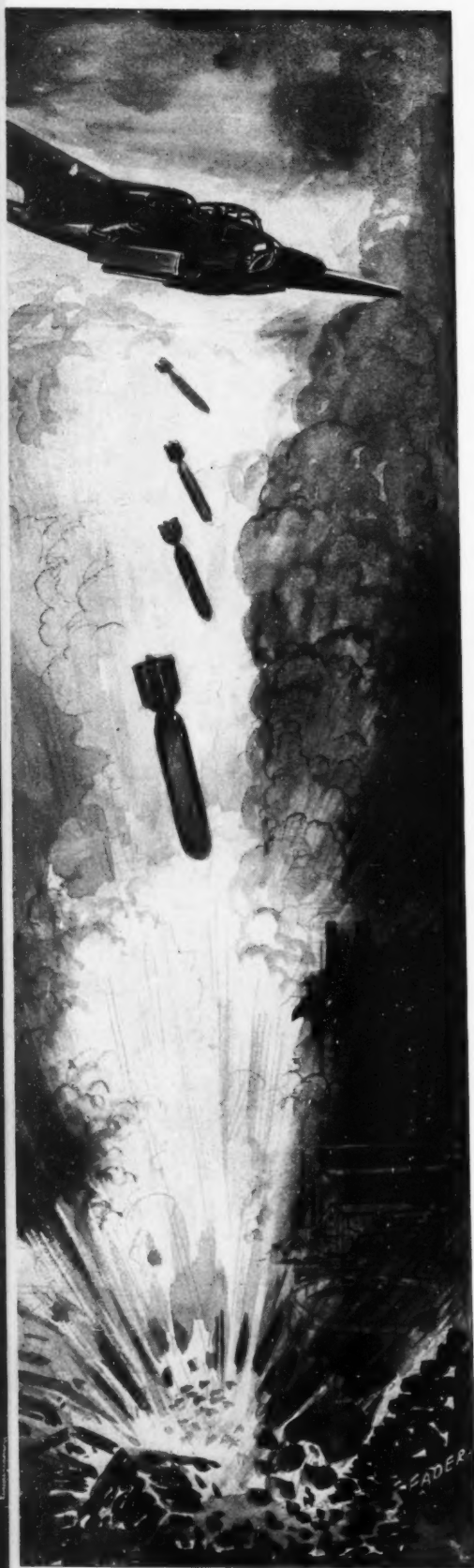
There is not much news on the Battle of Transportation in the Atlantic. Now and then its disasters flame in front-page headlines. You remember the "850 LIVES LOST," and the stories of rescuers about the lifeboats packed with frozen dead. The Navy's escort ship program has, with the high octane gasoline and synthetic rubber programs, first call on critical materials.

In the building of the fleets to fight the submarines, Douglas fir is a critical material. It is one reason why this lumber species is ranked with copper and aluminum by the War Production Board. The fir forest is the Navy's source of keel timbers up to 136 feet long, and of framing timbers, planking and decking. Even battleships and carriers are decked with Douglas fir.

An unrevealed but certainly large percentage of the subchasers and mine-layers for offense and of the mine sweepers, rescue tugs and submarine net tenders for defense, is in wood. Only Douglas fir can supply the large, clear-faced keel timbers for them. It is the preferred material for keelsons, stern and rudder posts, shaft logs, garboards, stanchions, deck and hold beams, bulkheads, hatch covers, and the like. The tug and barge fleets on our home harbors and the waterways of our foreign bases are to the Navy what the rolling truck fleets are to the Army ashore. In the main, they are built of Douglas fir.

*Britain's fastest bombers,
the Mosquitos, over Berlin*

AMERICAN FORESTS



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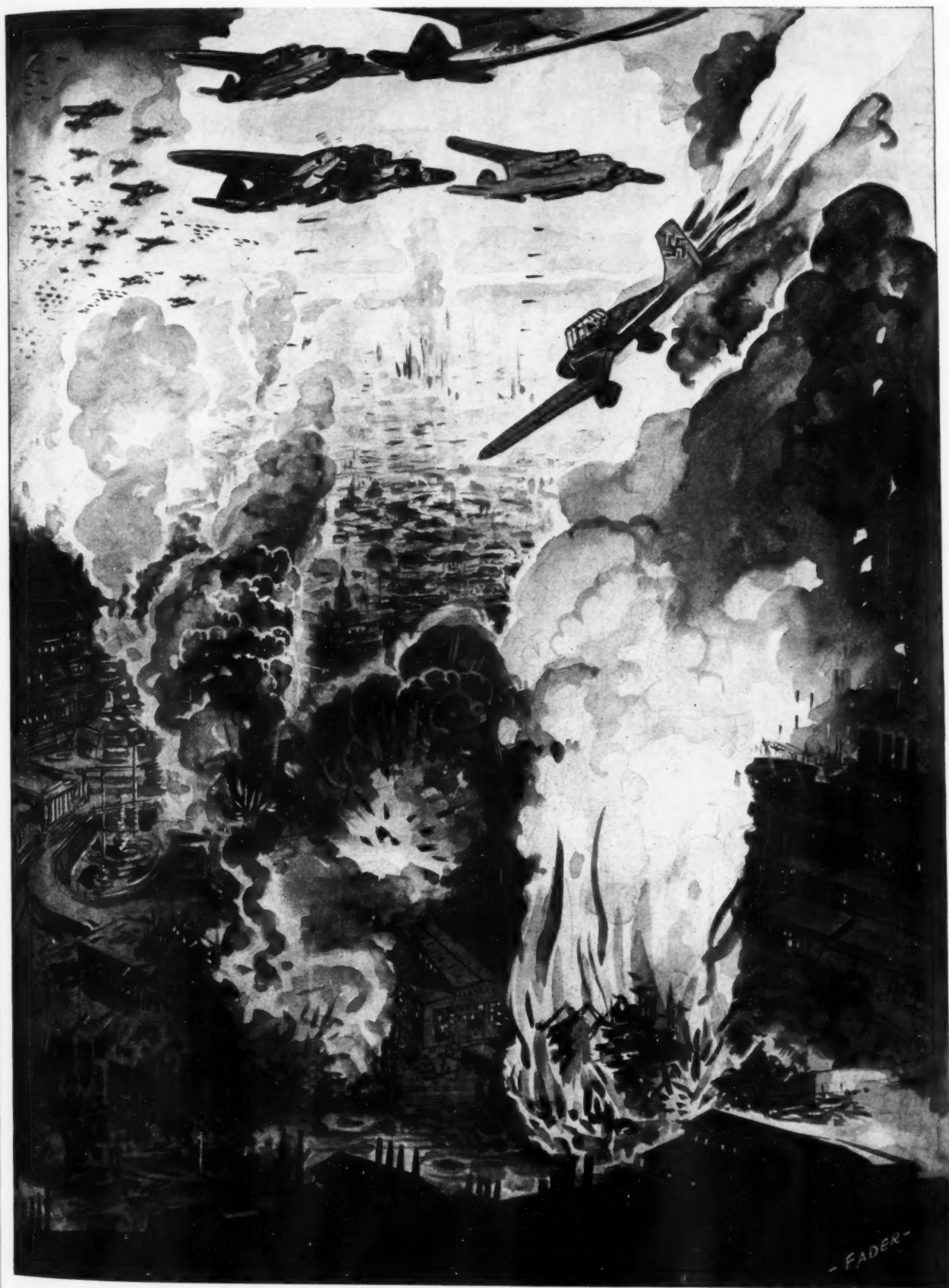
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MAY, 1943

The new timber hangars for the blimps that cruise the submarine front are the largest wood structures ever erected in this country. A thousand feet long, 250 feet wide, and 190 feet high, one of these "big tops" will cover approximately seven acres. They are an important war job of Douglas fir and of timber engineering.

Floating drydocks for the repair of stricken ships are another giant form of West Coast lumber war use.

Supplying our war in the air and our war on the water forms the two giant tasks of West Coast lumber for 1943.

All this is the big stuff. Here is another angle—from an outpost airfield in the desert of southern Tunisia. It appears in a *New Yorker* article on the

commander, Lieutenant Colonel Philip Cochran. "He lives," says the article, "in a *gourbi*, a Tunisian hut sunk in the ground and banked with sand on all sides. Unlike most *gourbis*, his has a wooden floor and walls. . . . It was built by a French corporal and a French Jewish Lieutenant named Leon. Only Leon, a talented forager, could ever have suspected the survival of such a quantity of building material in North Africa."

It is when lumber is scarce on any front that its values are truly appreciated by our fighting men. A newspaper friend of mine is another major at some remote but unnamed base. "You ask if lumber is important to us here," he writes. "If you could see us use every available piece over and over, until

nothing is left but slivers, you'd know just how important it is. . . ."

Did you read Captain Rickenbacker's epic story in *Life*? Remember how the men of the little island outpost at the first stage of rescue worked through a day and night to build a hospital shelter of lumber? None was a carpenter, yet the job was done, to the great benefit of the seriously ill Colonel Adamson. There was lumber for it. Lumber goes along with other absolutely essential supplies to the outposts of the islands.

News reports from the war correspondents are salted with such notes on lumber, but it is never featured. Wood is a material so familiar, so commonplace in the experience of every American, that its supply and use throughout the war effort, up to the very spearheads of attack, get little special notice. The Berlin bombing by the wood Mosquitos was a striking exception. No reporter notes species or forest source of the wood that he may chance to mention in a story. Lumber is lumber. There has always been a supply at hand when needed. In the main, this is true at the front.

It is a very good bet that the North African famine in building materials, as suggested by the *New Yorker* article, is now being relieved with lumber from the Douglas fir region. One wonders how many of the soldiers on that front will visualize the giant job of production and transportation that West Coast lumber in North Africa represents. Or how completely the entire expedition and its mission are rooted in forest products from the Northwest.

There was the transport that was torpedoed over two hundred miles from its objective. It was a slow sinking. The landing barges and boats were launched and loaded with fully equipped soldiers. The fleet proceeded, and landed just at the zero hour.

How many of the barges and boats were of construction that began with timber fallers and big trees in the Douglas fir forests cannot be told. We can just be sure there were enough to make another rousing chapter of West Coast lumber's going to war. And the freighters and transports of the colossal convoy—certainly a good share had lumber of the same kind in their structures, from bilges to bridges, and had been built in yards formed, from piling to mold lofts, out of West Coast forest materials. And there were the motor torpedo boats, with plywood skins; the subchasers and minesweepers, with Douglas fir keels and timbers; the cruisers and



Plywood skin on a frame of spruce is Britain's Mosquito bomber



For shipment to the war fronts, aircraft motors are crated in wood

carriers with decking of Douglas fir; the wood-built Curtiss transports which won such high praise for their European service from General Arnold.

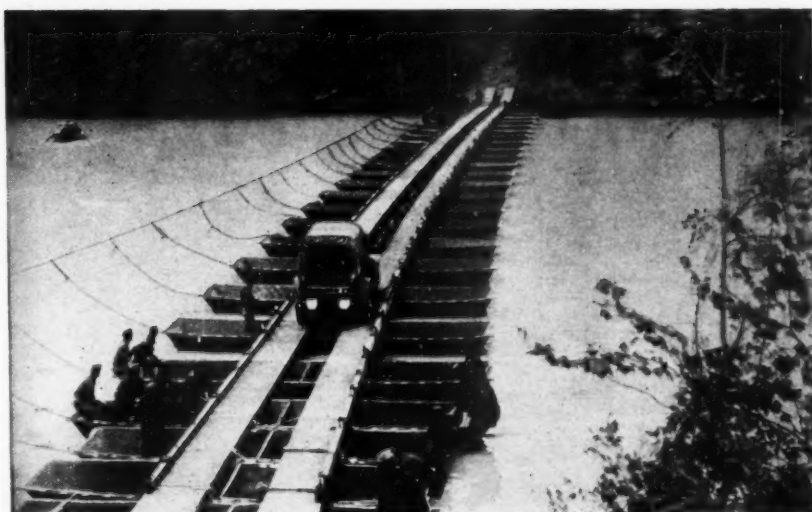
One may only guess at the West Coast forest products in the cargoes. Accounts of the crowded harbors, of the need for more dock installations, reflect the probability of structural lumber, of timber trusses and other prefabricated items, being discharged at the base ports amid the first landings of troops. Materials for warehouses, barracks, huts and advanced hospitals were surely unloaded with the units of Army Engineers and Navy Seabees. Think of Combat Engineer units, and you think of ponton bridges—a super-special West Coast lumber requirement—and of timber for trench systems and emergency fortifications. Army trucks with bodies of wood—most metal cargo items, from fighter planes to pistol cartridges, encased in wood. Also tent poles, turned from West Coast lumber, for Army outpost camps; strong Douglas fir rails for stretchers, to carry the wounded; tanks for gasoline storage at advanced bases, designed in Douglas fir and with composition rubber fabric linings; medicine and instrument cases—small items, perhaps, but of vital service.

All this, and much more that might be catalogued, can some day be told by chapter and verse on our North Africa expedition. It is a story that may be repeated in its basic features on United Nations fronts all over the world. The leading roles in this drama of a thousand vital uses on which the prosecution of the war depends, are held by the Douglas fir forest, and its men of the lumber world.

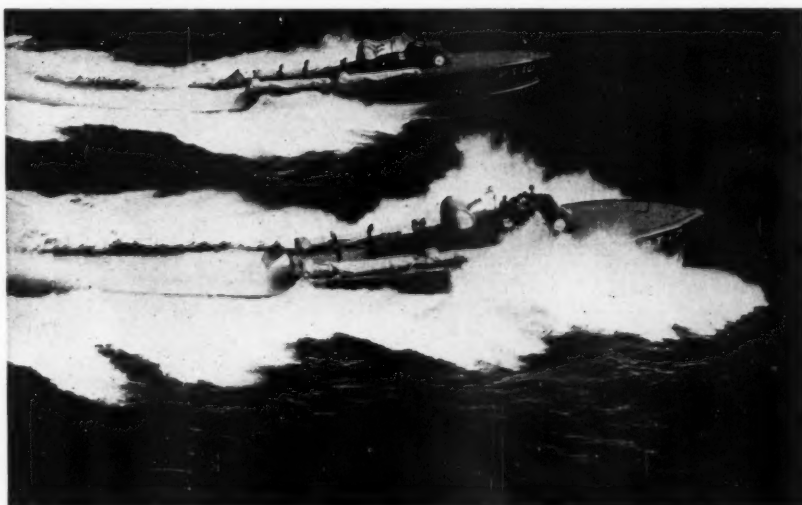
The Douglas fir is truly a fighting tree. The War Production Board has put its seal on this fact by reserving Douglas fir lumber for war needs, ranking it with copper and aluminum. No other lumber species has such distinction. It is really something wonderful to brag about, but the traditional reticence and modesty of the West Coast logger and lumberman forbid. In the advertising field, where even hook-and-eye manufacturers are broadcasting, "Whee! Look what we are doing in the war!" the bull of the woods sticks to his tree. Blanket makers get "E" awards, the forest front fighters of the Douglas fir woods and mills do not.

But that Berlin bombing made them feel mighty, mighty good. Their work,

(Turn to page 254)



Army truck, with wood body, on bridge of plywood boats and ramps



Large quantities of wood go into action with the famous PT boats



Keel and framing timbers from the West Coast fight the submarines



INDUSTRIAL FORESTRY MEETS THE SHOCK OF WAR . . .

By W. B. GREELEY

THE Douglas fir lumber industry of the Pacific Northwest is meeting the shock of global war. It is meeting it because permanent forms of forest management built upon the timber crop have been adopted. The transition from reckless exploitation of the early lumbermen began several decades back. The war caught this forward movement midway in its course, but sufficiently established to meet unprecedented demands for Douglas fir, Sitka spruce and the trees growing with them.

Students of the industry are well aware that it was cast in the mold of the great western migration, in the days of land grants to transcontinental railroads, when the West hungered for people and pay rolls. They know also that the Douglas fir forest had to go through decades of speculation and exploitation before more stable management could emerge. The very abundance and cheap-

ness of the raw resource made this inevitable. The early lumbermen were no better and no worse than the double-



Northwest logging foreman

fisted Americans who have followed every fresh discovery of natural resources—whether gold in California or oil in Oklahoma. With standing timber worth a few cents a thousand feet, they exploited and wasted. But they built the country; gave it the sources of work, transportation and public institutions. Still more, they created the engineering, technology and craftsmanship, without which stable forest industries could not have grown.

The change from "timber mining" to "timber cropping" began with more secure timber values, stronger ownership and more wood-using industries like plywood and pulp. The national movement for forest conservation has been strongly felt. To a considerable degree, the change has come about from industry's struggle and self-education in controlling forest fire. The fire hazard has always been—and still is—the greatest ob-

stacle to Pacific Northwest forestry. Not until the pioneer tolerance of woods burning had been replaced by organized control, from the statute books down through all strata of industry and people, could Douglas fir forestry get really started.

The Douglas fir logger has learned his forestry from learning to control forest fire and from his practical instinct for doing first things first. Effective fire prevention began when forest owners joined in employing guards for mutual protection. The Oregon and Washington legislatures made fire patrol compulsory—at the demand of lumbermen who had learned its value through practical experience. For the past forty years, nearly every legislative session in the two states has made some advance in the forest protection code—closed seasons on the use of fire, compulsory slash burning, more complete fire fighting equipment at logging camps, the felling of fire-spreading snags when timber is logged, vesting the state foresters with power to stop all logging in hazardous fire weather. From the tree roots of industry experience, have grown the most effective and restrictive systems of forest protection existent in any part of the country.

Out of this experience, the logger has learned how to grow trees. He has learned to respect the marvelous reproductive capacity of the Douglas fir forest and the asset it is to his land and business. When thousands of acres of second-growth fir are spread around

him, when he knows that an average acre, if well stocked, will produce 750 board feet every year, when he sees old-growth stumpage values climbing to three, four and five dollars a thousand feet—there's something to think about.

The industry has also profited immeasurably from its contacts with the United States Forest Service and the state departments of forestry, from the national cooperative policies set in motion by the Clarke-McNary Act and from the 293 trained foresters who have filtered into its ranks.

At any rate, the change from the old order is coming about. Its pace has quickened in the last ten years. The industry was ready, in 1933, to write into its NRA Code of self-government, an article requiring that logged-off lands be left in good condition for restocking. It was ready to continue this undertaking voluntarily, when all codes went out the back door of the Supreme Court. It was willing to work out its logging, slash burning and reseedling with the foresters put in the field by the associations. Probably three acres out of every four now logged in the Douglas fir region meet the standards of forest practice set up by the industry's forestry committee. These standards have been written into Oregon State Law, and the legislature of Washington also is considering their adoption.

As usual under American initiative, the movement for Douglas fir timber cropping has developed its own leaders—in forest-owning companies which



Three acres out of every four now logged in the Douglas fir region meet standards of forest practices set up by industry



Greatest threat to industrial forestry in the Northwest is the shortage of skilled woodsmen

have a long-range viewpoint and can translate the changing conditions of timber supply and the possibilities of timber growth into practical business programs. From the influence of these companies has come the "tree farm," an area of forest land registered by its owner as permanently in the business of growing timber. Twenty Douglas fir or West Coast hemlock tree farms with a total of 1,800,000 acres, have been so dedicated to future forests. Probably 800,000 acres more are under long-range timber-growing programs. Fifty-five trained foresters are employed in the management of these properties.

Another forward-looking step is in-

peace-time depletion. The less than 9,000,000,000 feet cut in 1941 and 1942, probably also in 1943, is well below two percent of the standing timber in the region. Considerably more than this was cut, every year, during the active building program which preceded the depression.

The war has intensified the normal cutting of high quality timber needed for military requirements. The Oregon coast and Olympic Peninsula, even southern Alaska, have been searched for high-grade Sitka spruce to maintain the allied air fleets. The Cascade benches have been combed for the finest noble fir; and logging roads have been

ging the run of the forest. No tears need be shed over these forest monarchs that have joined the Army or Navy. They were due to be cut, in any event; and their places will soon be filled with growing trees. In fact, conversion to a timber-growing industry requires the rapid harvesting of over-mature stands. They are "lumber-yard" forests, producing little or no new timber, often gradually deteriorating in volume and quality. The growth rate of the Douglas fir region is measured by the rate at which old, stagnant areas are changed into growing forests.

More regrettable are the inroads upon young Douglas fir forests, just in their



Out of his experience in controlling fire, the Douglas fir logger has learned to grow trees. Today, under the conditions of war, he is more fire conscious than ever before

dustry's forest nursery at Nisqually, Washington. This, described elsewhere in this issue, expresses the changing point of view—from fire protection to essential cutting practices, to tree farms, to fully stocked timber crops.

Thus, midway in an industrial transition, making headway but still with a long way to go, comes the impact of global war. The result?

War demands for West Coast lumber have taken no greater volume than

pushed into stands of West Coast hemlock where logs for airplane construction could be obtained.

The need for the best fir timber for decking battleships and airplane carriers, building ponton bridges, keeling and framing submarine chasers, as well as for plywood in aircraft and a host of other war uses, has overtaxed the capacity of logging camps since early in 1942. It has forced selective cutting of prime "yellow fir" in advance of log-

stride of rapid growth. The hundreds of thousands of piling needed for ship yards and cross-ties for both American railroads and Army Engineers overseas, have struck deeply into the young forests in the Pacific Northwest—the growing stock of the industry.

It is inevitable that the shortage of manpower, especially of fallers and buckers and other skilled woodsmen, combined with terrific pressure for
(Turn to page 266)

PUBLIC INTEREST IN THE DOUGLAS FIR REGION : By STEPHEN N. WYCKOFF

IF General Nathan Bedford Forrest had been a forester instead of a dashing Confederate cavalryman, he might have defined good forest land as that which would grow "the mostest trees fastest." And in so doing he would have described the Douglas fir region of the Pacific Northwest. Because of a peculiar combination of natural conditions — rainfall, temperature, soil—the forest lands of this region are capable of growing more trees faster and larger than almost any other part of the world. This, together with the fact that most of these lands are too mountainous to be used for farming, means that the region has been and always will be one of the nation's great wood- and lumber-producing centers.

The war has demonstrated clearly that every nation must have wood. It is necessary for lumber, plywood, pulp, and to an ever-increasing degree as a raw material upon which the chemist can work his wonders. This holds for times of peace as well as war. In that economy of full employment and production which the American people are beginning to see, however dimly at present, as the only tolerable condition to follow the trials of the war, wood in the many forms in which it can be used, has a great and definite part to play. To keep its woodpile the nation must keep its forests. And any reasonable national plan for permanent preservation of the national wood supply will include the operation of the great forests of Douglas fir, hemlock, spruce, cedar, and other trees in the Pacific Northwest as permanent sources of raw material.

Generally speaking, the most productive forest lands of the Pacific Northwest occur in the Coast Ranges and in the lower reaches of the Olympic and Cascade Mountains. These are commonly referred to as the commercial forest lands because their productivity and accessibility make commercial forestry possible there. Beyond and above them, however, are the great mountain masses of the Olympics and Cascades, culminating in towering peaks which are snow-

American democracy in forest ownership is written with a fine hand on the timber lands of the Douglas fir region of western Oregon and Washington. The twenty-six million acres in the region classed as commercial forest land is divided among some thirty-two thousand owners. The largest single owner is the federal government which owns about forty-five per cent. The rest is divided among the states and counties and large numbers of individual and corporate owners. As respects public interests and ownership, the author briefs the issue in these three sentences:

"Public interest in these forest lands takes the natural form of demand that those capable of growing commercial timber be managed so as to produce timber permanently and that the upper forests and mountains be managed to provide permanently for grazing, water-flow and recreation. This public interest transcends ownership. It is just as binding upon the individual or corporate owner of a commercial forest property as upon the government agency which exercises stewardship over those areas in public ownership."

clad most of the year. Despite the fact that timber of commercial value does not grow on these high altitude lands, they have a social and economic value which establishes public interest in them. Their use, and, correspondingly their value, is threefold.

The rich grasses of the high mountain meadows provide feed in summer for thousands of head of livestock. The use of the summer ranges of the high mountains is an integral part of western livestock production, and without this source of summer feed the industry would be greatly curtailed. In the high mountains are the headwaters of the rivers which provide irrigation for the farms in the valleys below and which turn the great turbines that provide electrical energy for homes and for the manufacturing industries the development of which is rounding out the economic base upon which the future prosperity of the region must be built. And thousands of people use the high mountains each year for purposes of recreation and rest.

The non-commercial forest lands are almost wholly in public ownership and will doubtless remain there. It is difficult to see how the management of their resources can be made to yield a profit and so become desirable for private ownership.

The Douglas fir region contains 25,-

790,000 acres of commercial forest land and nearly 550 billion board feet of sawtimber. It is interesting to note that while this area is only about five and one-half percent of that for the entire nation, the sawtimber volume is about thirty-four percent of the national supply. Lumber production of the region in 1941 was around nine billion feet, about twenty-seven percent of that for the country as a whole.

Public interest in these forest lands takes the natural form of demand that those capable of growing commercial timber be managed so as to produce timber permanently and that the upper forests and mountains be managed to provide permanent-

ly for grazing, waterflow and recreation. This public interest transcends ownership. It is just as binding upon the individual or corporate owner of a commercial forest property as upon the government agency which exercises stewardship over those areas in public ownership.

Permanent productivity of the forest lands and permanent maintenance of the watershed, grazing and recreation areas will mean first of all their protection from fire and from diseases and insect enemies. Without such protection there can be no permanent forestry, and no constructive forest management.

Forest protection is nationally recognized and organized as a cooperative undertaking. The federal and state agencies in charge of public forests are directly responsible for the protection of those forests. They also cooperate financially in the protection of privately owned forests. This is recognizedly justifiable because of the public interest in the productivity of the private lands and because many fires are started upon them by the public over which the private owner has no control.

Of the 25,790,000 acres of commercial forest land in the region, 11,540,000 acres, or forty-five percent, are in public ownership or stewardship, in the form of national forests, reversioned land grants, Indian lands, state forests, and lands in county ownership largely through tax



This group of virgin Douglas firs—standing twenty to the acre—illustrates the heavy yield of old-growth forests

reversion. The other 14,250,000 acres, or fifty-five percent, are in private ownership. Generally speaking, the latter are the most productive lands, capable of producing the greatest volumes of timber, and therefore represent the most favorable opportunity for the operation of timber production under the free enterprise system which is so much a part of the American economy. It is generally recognized that the forest lands of the region should be divided between public and private ownership, although the proportion of each is still a matter of discussion.

Maintenance of the productivity of the Pacific Northwest forests involves the orderly harvesting of the remaining virgin forests and the protection and treatment of the cut-over lands so that thrifty, well-stocked young forests will spring up in the shortest possible time. In some cases this will mean clear cutting of the virgin forest in a succession of areas sufficiently small to make cer-

And here, these youngsters—second growth Douglas fir—are growing at a rate of more than 500 board feet a year



tain that the surrounding forest can supply an adequate source of seed, disposal of the inflammable debris that invariably accompanies logging, and intensive fire protection for the young growth. In other localities, where the type of forest favors such a method, it will probably prove feasible to harvest the virgin forest by a series of selective cuttings which will gradually reduce the average age of the stand and will bring it into the category of a managed forest. But whatever method of harvesting the virgin forest is used, public interest demands that it provide for the establishment and protection of a new forest of desirable timber species to replace the old.

The cutting of the privately owned virgin forests of the Douglas fir region has not been carried on in accordance with this principle in the past. The effort has been to harvest the old-growth timber, in all too many cases without provision for the future. The result has been great areas of cut-over land remote from sources of seed and all too often ravaged by fire—conditions which preclude the establishment of a new forest. In many cases this seemingly valueless land was allowed to revert to the counties through non-payment of taxes. This has thrown a staggering burden of pro-



Above the commercial forests are the great mountain masses of the Olympic and Cascade ranges where are the headwaters of the rivers and the hinterlands of recreation for millions of people

tection costs on the counties and at the same time decreased their tax revenues.

Fortunately, this situation is improving somewhat. Fire control is becoming better organized and more intensive, so that the chances of second-growth stands reaching maturity are increasing. Certain areas of highly productive forest land in private ownership are now being managed for continuous production in a manner fully compatible with the public interest. The public could feel more assurance for the future if their number and extent were much greater. Some form of public control will doubtless be necessary to achieve the desired results.

If all of the commercial forest land in the Douglas fir region bore growing forests with normal distribution of ages from seedlings to mature trees, eight and one-quarter billion board feet of logs could be removed annually from trees over fifteen inches in diameter without depleting the growing stock. This is equal to the cut for 1940. The need for permanent production on this scale constitutes the interest of the nation as a whole in the commercial forest lands of the Douglas fir region. It will involve the gradual and orderly replacement of the remaining virgin forests, many of which are now too old to be making any net growth, with younger growing for-

ests. It will necessitate wholly adequate protection from fire, disease and insects, and the maintenance of forest growth on every acre.

As the second-growth forests of the Douglas fir region attain the minimum size for cutting, they have too frequently been cut out for poles, piling, ties, or whatever other products they may contain. Nothing can be more destructive to permanent timber production of the region. Trees of this size, forty to eighty years of age, are at the maximum rate of growth. For twenty to forty years they will continue to increase rapidly in volume and value, and will constitute the most extensive source of timber when most of the remaining old-growth timber is cut. Much of the material now being cut from these young forests is needed for war production, and therefore certainly must be secured from one source or another. It could be obtained, however, without the complete destruction of these growing forests. Light thinning cuttings in young forests can provide poles and piling, and will benefit rather than harm the stands. And old-growth forests, ripe for the ax and saw, and no longer making any growth, can supply the other items.

To attain these desirable objectives, a stable type of ownership will be needed.



By stable ownership is meant that which considers permanent timber production as a desirable form for the investment of capital and which is willing to give the protection and perform the silvicultural operations necessary to such an undertaking. It is contrasted with ownership interested only in the liquidation of the timber values on a given property but which has no desire to retain the land for subsequent timber crops. In every part of the country this latter, un-

(Turn to page 258)



AS THE GOVERNOR IN OREGON

THE history of forest use and the history of the United States go hand in hand. This is particularly true in Oregon, a state which has twenty-five per cent of the nation's sawtimber, leads all states in production of wood products and has a quarter million of its citizens dependent on the timber industry.

As with all new lands and new resources, the era of discovery in our forests was followed by an era of exploitation. Profiting by the experiences of older states and by scientific advances, however, Oregon is now well along in an era of conservation at a comparatively early period.


We have vast forest resources and the growing stock to put the industry on a permanent basis, and we have the technical resources and the will to accomplish this purpose.

It is fitting that the state which is first in forestry should also be first in constructive forest legislation. The Oregon Forest Conservation Act states that the conservation of forest resources and the continuous growth of timber are the public policy of the State of Oregon. We intend to implement this policy by a continuous program of constructive action. The development of sound forestry, as I see it in Oregon, goes far beyond the mechanics of timber cropping. It requires careful integration of a well-rounded program in the fields of forest education, taxation, protection, conservation and utilization.

In recent years there has been increasing recreational use and appreciation of the forests but not all our citizens understand the fire dangers this implies or the extent to which they are economically dependent on the forests. A beginning has been made in introduction of a forestry course at the high school level and through a state-wide "Keep Oregon Green" movement.

This educational work was aided in the past season by a public awareness of wartime values and wartime dangers. Fire losses and acreage burned over were the smallest in thirty-one years.

A beginning has been made, too, toward more equitable taxation through the reforestation tax law of 1929. This provides a small, fixed annual fee during growth of the crop with an additional severance tax when harvested. An outstanding need is a method of taxing standing timber to permit sustained yield operation on a basis just to all concerned. Much progress has been made in Oregon and the State is determined to reach further solutions.



Honorable Earl Snell
Governor of Oregon

EVERGREENS SEE IT

IN WASHINGTON

THE magnificent forests of Washington, the Evergreen State, have been our greatest asset since the days the first settlers pioneered our lands.

Sound public policy of the State of Washington demands that its forest resources be protected and conserved to the fullest degree compatible with the full utilization of such resources as a commercial and economic asset of the state. We must keep our lands productive by seeking to maintain continuous growth of timber on all lands suitable for forest use. Our economic life has been, and will continue to be, bound closely to our vast forests. Forests will continue to preserve our economy in the future if we, the citizens of Washington, on our part take the necessary steps to see that they are properly managed and adequately protected.

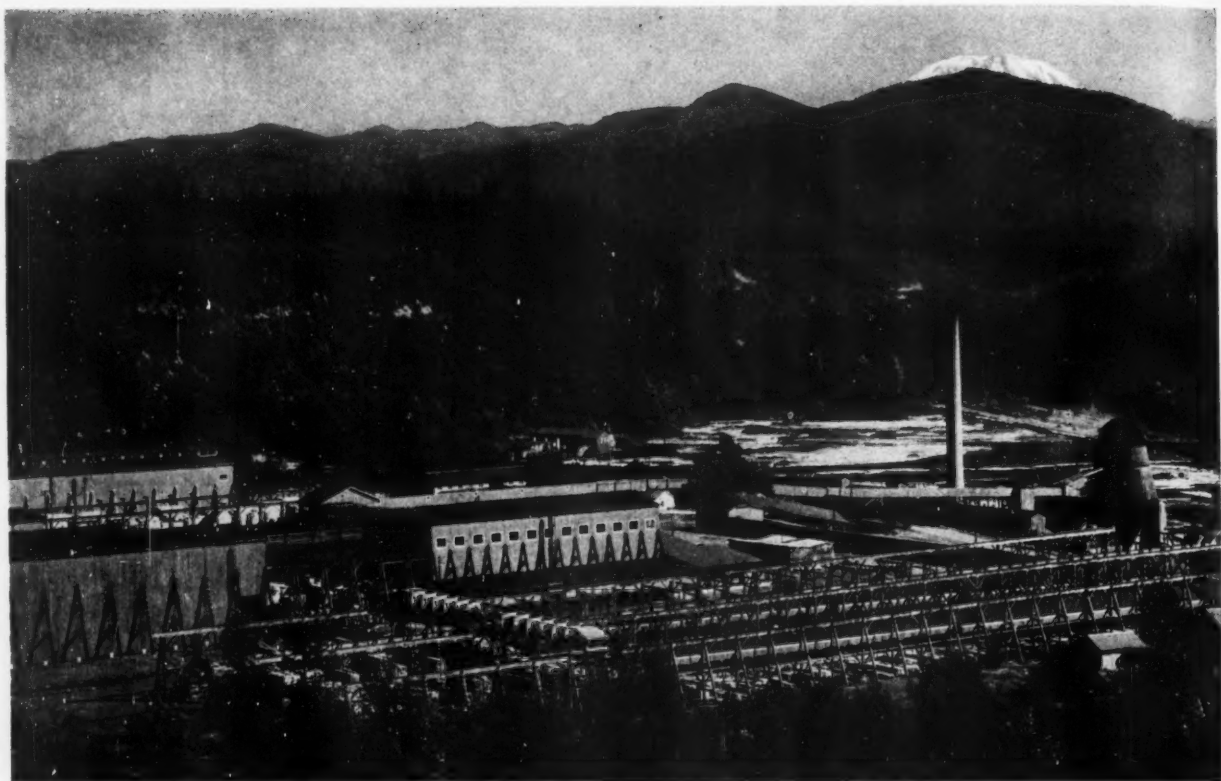
Our state gave the nation the slogan, "Timber is a Crop." We must plan our forest management on that basis. We must stop the policy of "cut and get out," for it is that policy which has contributed to the timber depletion in our eastern states. It must not happen here.

Our forests are now contributing materially to the war effort. From them come Douglas fir timbers, a product noted for unexcelled strength in structural use. They are producing the magnificent spruce lumber so vital to the construction of our airplanes. Our hemlock forests furnish the pulpwood which is put to unlimited uses in the war program. We can and will produce this material but we must also make certain that we will have an adequate residual stand of timber to carry on through the peace which will follow this war. Our climatic conditions are extremely favorable for rapid growth of timber. Properly protected from fire and disease, our cutover lands, when good cutting practices are observed in the harvesting of the timber crop, soon return to a productive state. With proper forest management, the people of Washington will always be able to reap an ample supply of forest products, to continue to enjoy our wonderful recreational areas and to have an adequate supply of pure water for our cities and towns. It is unthinkable that our intelligent citizens, lumbermen, logging operators and foresters alike cannot provide the essential management of these unexcelled resources. Washington can and must take immediate steps to insure citizens a continuous crop of forest products.



*Honorable Arthur B. Langlie
Governor of Washington*





It's a far cry from De Lin's little mill of 1852 to the modern western lumber plant of to-day. Trees and men have largely built the cities, homes and industries of the Northwest



TREES AND MEN

Together They Have Developed a Pacific Northwest Way of Life

By RODERIC OLZENDAM

I QUOTE from a book, "*Tacoma, Its History and Its Builders*," written by Herbert Hunt and published in 1916:

"Sixty years ago, what is now Tacoma's wholesale district on lower Pacific Avenue, was a swamp, with the yellow flowers of the skunk cabbage proclaiming the fact. Dense timber covered the peninsula. Fine springs here and there poured their sparkling gifts through the tropic tangle into the sea. For decades, if not centuries, the Indians had camped here. It was the red man's foregathering place for feasting and dancing, bear-hunting in the gulches where the salmon berries grew abundantly, the long sloping beach about the head of the bay was white with the clam shells of unnumbered banquets.

"Thus Nicholas De Lin, the Swede, Jacob Berhardt, the German, and Peter Judson, the Prussian, found the place when they came, as the brave scouts of succeeding generations."

On April 1, 1852, De Lin and his helpers reached Commencement Bay to build a sawmill. This mill, at the mouth of Galliher Gulch, cut 2,000 feet of lumber a day. Timbers were dragged to the mill by the ox team of Samuel McCaw of Steilacoom. Peter Anderson was the faller. About the little mill there used to gather companies of Indians to whom the whirling water turbine and its mystic transmission of power to the saw never ceased to be a wonder.

De Lin, the Swede, came in 1852. His house stood a few yards back of the mill facing the Sound. It was built of sawed lumber, the boards being put on upright. A cabinet maker, as well as millwright, De Lin and his brother proceeded to furnish the house with hand-made beds, tables and chairs, which Mr. Judson describes as having been "fine enough for the Tacoma hotel."

In 1854 *The Washington Pioneer*, published in Olympia, carried an advertisement, the first ever printed to bring attention to what was to be Tacoma. The advertisement read:

SAW LOGS! SAW LOGS!

The undersigned will let a contract for furnishing his mill with



The forest industries of the Pacific Northwest have bred a tough, ingenious breed of men from top to bottom

saw logs on the following terms: he will allow \$6 per log, to be paid in lumber at \$20 per thousand. Application to be made immediately at his mill on the Puyallup Bay.

January 20, 1853. N. De Lin.

These were the beginnings of Tacoma just ninety years ago. Out of that "dense timber" which "covered the peninsula," the people of Tacoma, have, with brains and hands, fashioned an industrial city of 150,000 people.

They have transformed that "dense timber" which "covered the peninsula" and the surrounding hinterland into enough wood to build more than three hundred thousand homes, seventy thousand farms, twelve thousand schools and libraries, three thousand five hundred churches, two thousand five hundred factories and thousands of tons of pulp for paper and other products.

Out of the forests from this region has poured wood by boat, train and truck to enrich and beautify and fortify the lives of men and women, boys and girls everywhere.

Tacoma is a typical American city hewed from the forests. Taxes, wages, money for education, for colleges, roads, telephone lines, railroads, harbors, docks—all stemmed from wood, nature's great, renewable resource.

It is a far cry from De Lin's little saw-mill to the big plants which string along Tacoma's waterfront today. The 2,000 feet a day of De Lin's mill swelled through the years to reach a war-year production of lumber in 1942 of 812 million board feet. But today lumber is only part of the story. Plywood mills have settled alongside the lumber mills now and are turning out plywood at the rate of over 165 million square feet a year. The wood furniture industry has grown to a five million dollar production. Tacoma's door industry in 1942 produced 3,100,000 doors and its pulp mills have an annual capacity of 162,000 tons. A new wood charcoal plant is coming into operation. Several boat-yards are building wooden mine sweepers and similar auxiliary vessels. Specialized plants are producing timber-connector trusses and similar items.

Finally, going beyond the industries resting directly on wood, Tacoma has rounded out its economic life with metal-producing plants, metal fabricating plants, chemical industries, grain processing plants, and there have of course been the full range of activities, developed as needed, to serve the basic industries—transportation, shipping, power, wholesale and retail trades.

So far, this article has the appearance of being purely an advertisement for the city of Tacoma, the city in which I live and work. That is merely happenstance.

I cite the data for this city because I have the information conveniently at hand and because what has happened here is typical—with local variations, of course—of what has happened in the forested areas of the Pacific Northwest as a community of the whole.

The forests had been here for thousands of years. They grew, matured, died. They served the aboriginal peoples for little more than game cover, fuel and an occasional dugout canoe. It was not until the white man came and applied enterprise, ingenuity, perspiration, mechanics and science that the Pacific Northwest forests blossomed into full service and provided the broad base on which a modern civilization still continues to build.



High climber—his job is the most hazardous of all

To realize the assets which had for centuries lain dormant in our forest resources man has had to explore unknown corners in the field of learning and to utilize with thousandfold ramifications the knowledge accumulated. He has applied *mathematics* in cruising and surveying his lines of operation; he has applied *engineering* in laying out his railroads and trucking roads and in designing his mills; he has applied *metal-lurgy* in developing saw blades, planer knives and machinery; he has applied *meteorology* in developing forest fire protection; he has applied *physics* in developing greater variety for wood products; he has applied *chemistry* in developing preservatives and adhesives to

bring forth such things as treated lumber and plywood and to convert a tree into a purse of artificial silk; he has applied *biology* in combatting insect enemies of the forest and in growing seedlings to restock harvested lands.

The forest industries of the Pacific Northwest have provided some invaluable proving grounds for other industries. In few places has the mechanical engineer and the railroad engineer encountered a tougher variety of problems than those he has had to solve in getting big logs down off wild, rugged mountainsides. The automotive industry owes much to the experience it gained from venturesome loggers who first had the temerity—and only a few years ago—to load a log on an old Model T Ford. Constant overloading, primitive roads, punishing grades—the challenges of such conditions brought forth a rapid flow of new developments in tires, springs, axles, motors, gears, lubricants and fuels in addition to virtually a new science in road building. Out of it all has come a broadened field of knowledge now utilized by other industries which come in contact with truck transportation—not to mention ideas now incorporated in the punishment-absorbing military vehicles of Uncle Sam's 1943 Army.

The forest industries have bred a tough, ingenious breed of men, from top to bottom. The boss lumberman has long been known for his fierce, individualistic independence; no less, the man with the ax has developed these same characteristics. Employer and employee, both are noted for their refusal to be stumped by problems; they snap their fingers at tough conditions on the job. Mud, snow, rain, cold, dirt, grease, heat—they labor on and get out the logs. They have fought fiercely with each other at times. But, out of these differences of opinion, they have melted down in the cauldron of industrial and social experimentation, a Pacific Northwest way of life—in the logging camps and in cities like Tacoma, Longview, Enumclaw, Eugene, Bend, Klamath Falls—a way of life that is the envy of the world.

So, to the other "ologies" which have found a fruitful field of experiment in the forest industries one ought to add another, *sociology*.

All these dynamic forces are now being directed towards developing a new pattern of forest management. Together, the men of this region are turning more and more to the growing of new and successive crops of trees in this vast forest empire in order that trees may be available decade after decade and used in more ways than we ever dared to dream of.

Trees and men—together they comprise no pantywaist industry.

DAVID DOUGLAS—A Sketch

By LILIAN CROMELIN



DAVID DOUGLAS—1798-1834

TO few men is given the grace of such an ever green, living memorial as that accorded David Douglas, eminent Scottish botanist and plant explorer. For, from the feathery foliage of the smallest tree to the towering shaft of the forest giant, each Douglas fir—and there are millions of them—salutes him, this species named in his honor. This was done, following his sending of specimens back to England of the "gigantic species" he found "in immense forests in Northwest America." Interestingly enough, Lambert wrote—in his prodigious monographs of the period: "The materials whence my former account of this species was derived were so imperfect, and the name I had applied being by no means a happy one; and the more especially as the Silver Fir has been called *Abies taxifolia*, I gladly adopt the name of *P. Douglasii*, in honor of the indefatigable botanist to whom I am indebted for the specimens from which I have been able to complete my description and plate of the species."

Long, and fascinating as a storybook tale, would be the full life of David Douglas, ending in his tragic death in the Sandwich Islands, far from his native Scotland. Son of a stone-mason, he was born at Scone, near Perth, in 1798. From early boyhood, natural history and books of travel held him spellbound, and he spent what leisure time he had in the fields collecting. Often in difficulties with his schoolmasters because of a cas-

ual attitude toward his studies, the important business of life to young David was fishing, and the collection of birds, nests, eggs and other natural specimens—from which he refused to be diverted. Consequently he was apprenticed for seven years as gardener to the Earl of Mansfield at Scone—thus early beginning a botanical career destined to be of world-wide influence. At eighteen he went to Valleyfield, in the service of Sir Robert Preston and, when but twenty years old, entered the Botanic Garden at Glasgow. This move was of tremendous import to him for then he first came in contact with the famous botanist, Sir William Hooker, whose lectures fired Douglas with even greater zeal. When, later, he was selected by the Royal Horticultural Society for field work in the New World, he slaved to fit himself for the task, often putting in eighteen hours a day. He was to go to the Columbia River country in the Northwest. The journey from Gravesend, at last begun, took nearly nine months and was broken only by landings at certain islands for the collection of plants and birds. Rounding Cape Horn, he visited Juan Fernandez and the Galapagos, arriving in Fort Vancouver in 1823.

Consumed with impatience and eager to get at his beloved work, Douglas could hardly wait to reach his objective, and started collecting as soon as he arrived in the Northwest. Strangely enough, on the first day of his travels, he found the great tree that was later named for him. Ranging far and wide, he covered more than seven thousand miles in two years, during which he suffered untold hardships. His incredible adventures began with this exploration. Traveling with his gun and little else, he slept almost invariably in the open—his little shaggy terrier often his only companion. Pushing on through the wildest country—his arduous work in the bitter cold and sometimes through scorching heat, and his encounters with hostile Indians and wild animals were enough to tax the strength of even the hardiest of men.

But, driven by his indefatigable will, he followed eagerly any clue to a new botanical specimen. As an instance, it was in August, 1825, in a trip up the Multnomah River, that he discovered certain seeds in the tobacco pouches of the Indians, which he learned they used as food. They told him they came from

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MY COMPANY'S PROGRAM



THE Pacific Northwest has provided a melting-pot of forestry of a distinctly American mould. The virgin resource with its lure to the pioneer, the growth of a great industry and the sweep of mass production, the setting aside of national forests followed by the powerful impact of conservation, were elements poured into the cauldron.

Then came a great catalyzer, the united effort of government, state and citizen to control forest fires,—a yearly threat to the management, use and perpetuation of the forests of the region and to the industries and public activities based upon them.

From this brew of fifty years' boiling, comes a precipitate of exceptional significance. Industrial forestry on a broad commercial base is established and making headway. It carries on side by side with public forestry. The next few decades

will bring interesting comparisons of timber growing for public benefit with timber growing as a private enterprise for the investment of capital and the exercise of individual initiative.

Special interest attaches to forest conservation in the Pacific Northwest because there, more than in any other forest region in the United States, the movement has overtaken the stage of timber liquidation. It has all happened within the biblical lifetime of man. With practically half of the virgin commercial timber still standing, the industry is pushing forward and bringing more and more forest areas under plans of forest management.

Most other softwood regions in the United States had practically to cut out their virgin timber before forestry really took hold. In the Douglas fir region of the Pacific Northwest—and the same is

true in the ponderosa pine and redwood regions of the West—management for growing trees has overtaken liquidation of old timber in time to permit a merging of the old and new philosophies of timber investment and the development of sustained crops of forest growth while there are still large areas of old growth timber to manage.

All of which, to an interested observer, reflects a wholesome interplay of public and commercial interest, of education and free enterprise, in the democratic fashion.

To show the definite trends in private timber-growing in the Northwest, AMERICAN FORESTS is happy to present in the four pages which follow statements from executives of several forest-owning companies, which are among those seeking to make their forest lands yield continuing crops of timber.—Editor.

By D. S. DENMAN

Vice-President,

Crown Zellerbach Corporation

A PLANNED future for its forest holdings in order that there will forever be sufficient wood to keep its numerous pulp and paper mills supplied is a deeply-entrenched policy of Crown Zellerbach Corporation.

Benefiting from forty-two years of experience, experiments, disappointments and progress in Pacific Northwest forests, we are now moving constructively forward on a cutting, growing and protection policy which will eventually give us what all self-contained forest industries aspire to—a growth equal to or better than the amount of timber necessary to keep our customers supplied with pulp and paper products.

We have not laid down any single standard to cover all our forest lands. Rather, our foresters have studied the areas and developed various blueprints and specifications adapted to the terrain, the soil, weather and growing conditions. In certain areas where weather bureau records indicate recurring high winds, clear cutting and new growth is the blueprint. In these areas we have learned from experience that neither selective cutting nor leaving blocks of seed trees indiscriminately throughout the area has been practical. The selectively cut areas and the seed trees have blown down in the high winds that are prevalent each winter along the Pacific Coast. In these areas we now stagger the logging with seed tree blocks which are left in sheltered areas only and where the prevailing winds will carry the new seed long distances to re-seed the cut-over lands. In these same areas insofar as it is practical we refrain from slash burning. This naturally imposes intensified fire protection.

In other areas we are adding young growth to the older forests and leaving these areas as temporary sanctuaries, or sustained growth blocks, not to be harvested until the cruise shows that growth has reached a point where it will be practical to keep the amount of wood cut in balance with the growth.

In still other areas large forest blocks are already operating on the sustained yield principle. One example is in our operations at Neah Bay, Washington, on the Olympic Peninsula. Here, in cooperation with the U. S. Department of Indian Affairs, we are demonstrating the practicability of sustained yield. The tract is large enough and well suited to a program of keeping the cut and growth in proper balance. This project has in-

involved the construction of many miles of fire-fighting roads, establishment of water reservoirs and cooperative fire-fighting crews and equipment with the Indian Forest Service.

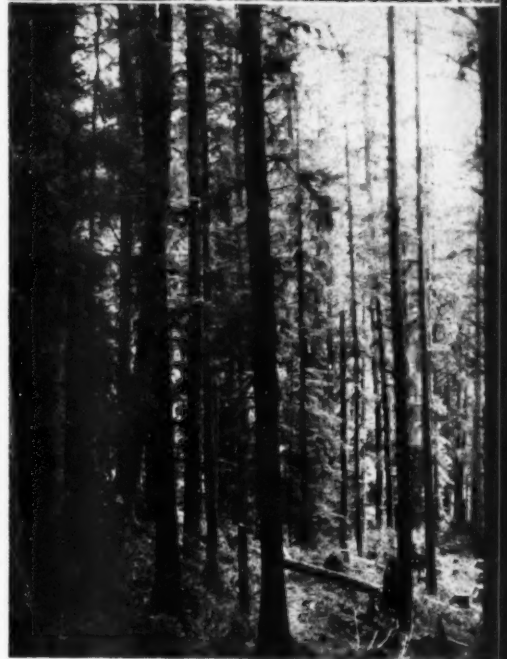
In 1931 the present Company started to cut selectively its Young's River block by utilizing tractors in logging. This program has been expanded each year since and it is now company policy to cut selectively all those stands where experience has demonstrated this method of cutting is practical.

Today, selective cutting in our Seaside, Oregon, timber is one of our most important war activities—involving the bringing out of high grade "aircraft" spruce for Uncle Sam's growing air fleets. When the war is over and equipment becomes more available, we plan to log selectively second growth pulp timber by actual large scale tryouts of various types of machinery and various methods and degrees of tree selection. As a matter of fact, we plan establishment of an experimental logging camp in the Pacific Northwest to determine scientifically how to make the fullest possible use of mature trees and still leave the forest in the best shape for growth and successive crops of timber.

In cooperation with other forest industries, Crown Zellerbach operates a tree nursery at Nisqually, Washington. From this nursery we will take five million seedlings in the next five years for planting on cutover areas where fires or ground conditions indicate delay of natural re-seeding.

From our own and other forest experiences, we have learned that trees are a practical renewable resource. Protected from fire and natural enemies, trees keep on growing through wars, depressions or boom times. Employing the most scientific and practical forest management practices under the planning of our foresters, Crown Zellerbach hopes to help along this tree growth on its 300,000 acres of timberlands so there will always be ample wood for tomorrow's paper products and tomorrow's jobs.

Various methods of cutting are used by this company. Top—clear-cutting, leaving blocks of trees to seed the cutover areas. Center—selective cutting or removal of only a part of the timber. Bottom—a clear-cut area restocked with spruce and hemlock





Second-growth Douglas fir in a Weyerhaeuser tree farm, guarded by mechanized fire protection

By J. P. WEYERHAEUSER, JR.

Executive Vice-President,

Weyerhaeuser Timber Company

"THE policy of the Weyerhaeuser Timber Company is to operate its properties in such a way as to provide a permanent and profitable investment for capital; to bring about continuous, profitable and enjoyable employment for men; and to furnish society with uninterrupted supplies of forest products."

... Since 1900, when Weyerhaeuser Timber Company acquired its first timberlands, its actions have been consistent with this recently expressed policy. Four years after this initial plunge company officers acted upon a suggestion of Gifford Pinchot, then Chief of the United States Bureau of Forestry. Under this proposal, the Bureau surveyed the holdings of the company and recommended a fire protection program as one essential element of forestry. The recommendation was carried out and paved the way for the creation of cooperative fire protection after the serious fire season of 1902. These fire associations have since intensified and expanded their activities with the company's support.

Today, in the company's tree-farm and operating areas one finds mechanized equipment and fire prevention, detection, and suppression machinery ap-

proaching that of streamlined city fire departments. There is also a corps of trained foresters mapping each reproduction area. "Site quality," "rate of growth," and other forestry terms have become bywords in the woods operations. The logging crews have become reproduction conscious.

The timber conversion units of the company have grown from 1906, when a sawmill was purchased in Everett, until in the 1930's, when the present sawmill

and pulp operations with their corollary plants for by-products came into full operation. To insure sufficient volume and justify sales representation in all markets, the Weyerhaeuser Sales Company was created in conjunction with other lumber companies. Lumber storage and remanufacturing facilities for quick shipment were also created, first at Baltimore and later at other points on the Atlantic Coast, in California, and in Minnesota, and steamships were put into intercoastal service, insuring cheap transportation via the Panama Canal.

The efforts of the company's engineers have been constantly to improve both product and plant processes. In the 1920's research activities uncovered new uses for wood products—calling into existence the Wood Conversion Company, which has pioneered successfully in producing many well-known products from wood. In the 'thirties the company entered the pulp business and helped pioneer a market for the then little-prized species—West Coast hemlock. One outstanding 1942 process development is now saving sixteen percent of the hemlock log formerly needed to manufacture a ton of pulp.

Timber reserves for the plants have been maintained and augmented wherever possible, with permanency in mind. Ownership of substantially all cutovers has been maintained. To these have been added purchases of both second-growth and recently logged areas. These lands are largely incorporated in tree farms in which fire protection has been intensified and non-stocked areas are being replanted.



A view in the company's laboratory at Longview where research seeks to improve wood conversion processes and to develop new uses for wood

By C. H. KREIENBAUM

Executive Vice-President,

Simpson Logging Company

THE history of the Simpson Logging Company of Shelton and McCleary, Washington, is closely interwoven with the development of Mason and eastern Grays Harbor counties. Since the early 90's the Company has been the major industry of the area. Starting as a producer of logs, it built the first sawmill at Shelton in 1925, and with the acquisition of the Henry McCleary Timber Company's mills at Shelton and Mc-

retain ownership of its cut-over lands. Recognizing that protection is the key-stone to future crops of timber, it has pioneered with other progressive companies in securing better fire protection, first through private fire associations and later in co-operation with state and federal agencies.

As a result of increasingly better fire protection, a large proportion of the company's 100,000 acres of cutover

for fire roads, and during the fire season having additional men and equipment available in the area for fire suppression. The program involves the building and maintenance of over one hundred miles of new roads and fifty miles of telephone lines. Four look-outs, maintained in cooperation with state and federal agencies, cover the area. Logging and railroad operations, in addition, are well supplied with the latest in fire fighting equipment.

The company employs foresters who have just typed on an intensive scale its cutover lands and those of intermingled ownerships. These data will be the basis of future management.

Cutting plans for mature timber are being developed in cooperation with the



Panoramic view of lumbering operation of Simpson Logging Company in area where company lands are intermingled with national forest lands. Background of picture shows staggered cutting whereby strips are left uncut to seed in surrounding areas. Middle section shows scattered seed trees left for the same purpose

Cleary in 1942, it now furnishes the logs for two sawmills and a plywood plant at Shelton, and a plywood, door and furniture factory at McCleary. About 1,200 persons are employed in its logging, railroad and manufacturing operations. Over ninety-five percent of the finished products are essential for the war effort. The hemlock logs produced go to the pulp mill of Rayonier, Inc., located at Shelton.

The policy of the Simpson Logging Company from its inception has been to

lands supports a well stocked stand of young timber, mainly Douglas fir, from five to fifty years in age. The policy of the company is to manage its timber, both mature and immature, so that communities such as ours, dependent on forest industries, will have a continuing supply of forest products.

This sustained forest policy involves effective protection of all timberlands from fire. To this end the company is supplementing association, state and federal efforts by opening up old grades

Forest Service, where the company holdings are intermingled with federal lands. Proven cutting practices favorable to regeneration are being followed. This involves selective logging in places and clear cutting in others, dependent on ground conditions.

Full development of these plans will depend upon Congress passing a bill now pending which provides authority for sustained yield management under cooperative agreements between the government and private owners.

By CORYDON WAGNER

Vice-President

St. Paul & Tacoma Lumber Company

THE St. Paul & Tacoma Lumber Company was organized in 1888, when Washington was still a Territory. From that date it has carried on continuous sawmill and logging operations and its present plant has a capacity of approximately one hundred million board feet a year, with complete facilities for shipping by water and rail. The company first began logging on ground that is now the Allenmore Golf Course in Tacoma. Much of the early logged land

now is being farmed. That on the higher, rougher ground is still in company ownership, and contains an excellent young forest of second growth fifty to 125 feet high, much of which will reach commercial maturity in another twenty-five years.

From 1888 to 1914 the company's annual cut was in balance with the sustained yield possibilities of the timbered area under its management. The advent of state and county bond issues and the

resultant higher taxes for roads, schools, and public works, brought on the necessity for larger annual cuttings, so that now in order to round out a sustained annual cut of 125 to 150 million feet per year, it will have to draw to some extent on tax-free government and state-owned timber lying within and adjacent to company-owned forests.

The company has employed a forester to advise it with its land and forestry problems since 1924. It has had its land classified for forest growing use, selling only lands that are suitable for agricultural purposes. Fire prevention has always been paramount. The early logged off land is restocked predominantly to Douglas fir mixed with western red cedar and West Coast hemlock.

Attention is being given to natural seeding of cutover areas in order to get more uniform and quicker reforestation. On areas where reburning occurs or seed trees cannot be left, planting is to be resorted to. Due to heavy accumulations of slash after logging virgin timber, it is essential for fire protection reasons to burn the accumulated debris. It is the company's policy to do this work currently with logging, but due to unpredictable shut-downs, it is at times impossible to synchronize slash disposal operations and logging. Burning can be done with safety only during a few days each fall.

Because of the defect and deformity of the suppressed trees in the virgin timber in which the company operates, and because of the company's desire to grow Douglas fir, which is more intolerant than its associated species and not able successfully to establish itself under a residual stand, the plan of selected area clear cutting is now being practiced. On these areas a new forest, predominantly Douglas fir, can be grown that will, in sixty to seventy years, depending on the quality of the soil, yield 30,000 board feet or more an acre. On the accessible areas, thinning out trees suitable for pulpwood and cedar poles may prove profitable in forty-five-year-old stands.

The policy of the company in brief is to so manage its forest property that consistent with good business methods and requirements, its land will be kept growing trees and yielding continuous crops of timber, thus providing steady employment of labor, aiding community development and betterment, and yielding reasonable returns to its owners for their stewardship.

Above—The company's forester and woods boss discuss a problem on the ground. Below—A new timber crop on land logged forty years ago



INDUSTRY STARTS A FOREST NURSERY

Ingenious Methods at Nisqually, Washington, Speed Mass Production of Young Trees

By STEWART HOLBROOK

OUT in a handsome clearing along the Nisqually River in western Washington is a sight to cheer the bleakest soul. On forty acres of smooth, level ground, hedged by forest and facing the wild Pacific shore, are wide beds of young seedlings marching across the rich soil in bright green columns, ten million strong.

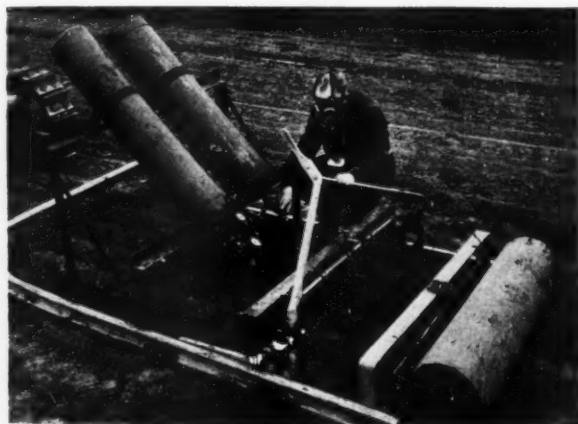
Here is a forest industry tree nursery, owned and operated by progressive loggers and lumbermen of the Douglas fir region of Oregon and Washington to raise trees for planting on non-restocking burned and cutover areas. It is a cooperative effort of private industry,

and has no aid from state or federal sources. It is the result of half a century's experience in harvesting and growing timber along the Northwest coast. It is also the first large-scale undertaking of a group of lumbermen to pool their efforts in the growing of young trees with which to replant their forest lands.

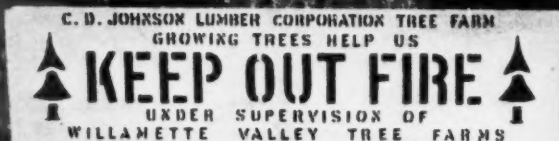
The Nisqually Nursery was the original idea of Corydon Wagner, Tacoma lumberman and at that time president of the West Coast Lumbermen's Association, who suggested it to his group as a needed project. The idea met with approval by the association. The Weyer-

haeuser Timber Company gave it further impetus by offering to close its own tree nursery at Snoqualmie Falls and to buy its seedling stock from the co-op enterprise. Warren Tilton, now a captain in the armed forces, who was forester for the association, was given an appropriation and told to go ahead. As of January 1, 1943, the nursery represents a cash outlay of \$60,000.

What makes this forty acres outstanding and not just another tree nursery are the modern and ingenious methods used to propagate trees, to control their growth, and to lift them from the beds
(Turn to page 260)



Some mass production operations—upper left, gassing the soil to kill weeds; upper right, weeding and thinning from tree buggies; lower left, loosening soil for harvest; lower right, sorting table



WILLAMETTE TREE FARMS

A Cooperative Project of Industry

By EDMUND HAYES

COOPERATIVE industrial forest management is receiving its first trial in the forested foothills and mountains bordering the Willamette Valley of western Oregon. In this area and to the south of it lies the bulk of the old-growth timber reserves in the Douglas fir region of the state. Here, also, lie extensive stands of young trees of varying age classes which have followed the initial logging operations or early forest fires. Soil and climatic conditions are excellent for tree growth. The continued welfare of the entire region is contingent on a permanent source of raw materials for its forest industries.

Early in 1941, a group of forest-owning lumber manufacturers initiated an action program designed to insure for their mills and for the communities dependent upon them a continuing source of raw materials. This group included the Booth-Kelly Lumber Company, the

Row River Lumber Company, the Snellstrom Lumber Company, the C. D. Johnson Lumber Corporation, and the Lewis Lumber Company. Their combined forest properties approximate some 220,000 acres, about half of which is still in over-mature old growth timber. The balance is in varying conditions of restocking—some already adequately restocked, some, due to fire damage, in need of planting.

The forest management program of the Willamette Valley Tree Farms, as the cooperative project is known, was initiated in January, 1942. The initial project undertaken was fire protection planning. This was given priority because adequate fire protection is the predominant requirement in western forest management and because the western Oregon forests are a major source of lumber, timber, plywood and other forest products essential to the successful

prosecution of the war. The fire protection plans and the resultant action programs have materially reduced the likelihood of extensive fire damage and loss.

Following the completion of fire protection plans, the Willamette Valley Tree Farms staff began the establishment of a series of demonstration tree farm tracts on the several properties. The purpose of these tracts is to provide detailed and comprehensive facts relative to productive capacity of typical forest lands in the area. The analyses of these demonstrations provides concrete factual information on the ability of the lands to produce forests, the rate at which the typical junior forest grows, the potential volume of materials obtainable currently and in the future, the quality of the materials being produced and all other information pertinent to intensive, intelligent and practical industrial forest management. (Turn to page 256)

To insure for the lumber mills and for the communities dependent upon them a continuing source of raw materials, is the purpose of Oregon's industrial tree farms



SNOHOMISH—FIRST WESTERN FARM-FOREST CO-OP

By ALBERT ARNST

FARMERS in Snohomish County, Washington, are echoing the logger's "Timber!" chant with new lustiness, for they are all-out to ax the Axis cooperatively with sawlogs and piling from farm woodlands.

Snohomish County is a timber reservoir whose wood fiber is flowing to the throbbing war industries of Seattle and Everett. Second growth Douglas fir and western hemlock stands are being tapped in a Paul Bunyan drive to feed the hungry mills. Wood, now a priority material, has become a versatile substitute for scarce metals. Regrettably, in harvesting this vital wood crop, forest perpetuation is not always considered.

But Snohomish farmers, already producing record food-for-freedom crops, are cutting their woods to keep them. Conservation cropping of field and forest is natural to these part-time woodsmen, for since 1938 they have been cooperating with the Department of Agriculture in following conservation land-use plans developed with Soil Conservation Service agronomists and foresters.

They have learned from these service representatives that farm woodland management is a contribution to the small farmer's income and a check on depleting soil erosion. They have also been made to understand forest values in relation to watershed protection and community welfare.

Snohomish County is forest-nurtured, with eighty percent of its rolling to steep topography not agriculturally adapted, as scattered abandoned homesteads testify. Over half of the county's inhabitants derive livelihoods from logging and wood-using industries.

About ninety percent of Snohomish farms are owner-operated and the average farmer works off his farm about 190

(Turn to page 248)

Above, typical Snohomish farm has sixty acres of woods

Center, co-op sales areas are marked to assure future crops

Below, second-growth Douglas fir yields long piling timbers





HOW LABOR VIEWS TIMBER CROPPING

**With His Home, Job and Usefulness as
a Citizen at Stake, the Lumber Worker
is for Good Forest Practices**

By PETER E. TERZICK

THE day in 1788 when Captain John Mears loaded his ship with logs and started for China is a red letter day in the annals of the Pacific Northwest, for although Mears and his ill-fated vessel never reached China, his venture signaled the birth of the Northwest lumber industry. Mears has been dead these many years, but the industry which he pioneered has continued to grow and to flourish.

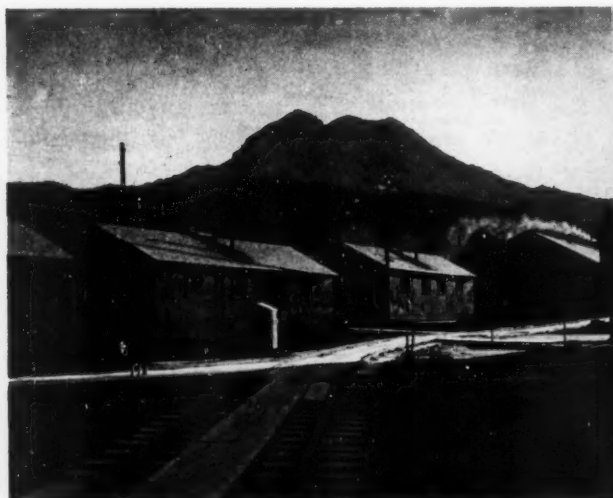
Lumbering always has been and always should be the backbone of the Pacific Northwest industrial economy. Few people realize this better than the lumber workers. Consequently, few people have a more deep-rooted interest in the preservation of the Northwest timber re-

sources and the perpetuation of the forest industry which they support.

No longer is the lumber worker a wild, uncivilized, unwashed individual. Today he is a family man; he owns a radio and drives a car and lives in a community in whose welfare he takes an active interest. His children go to school and his wife attends Red Cross meetings and belongs to the community club. His earnings afford him a way of life comparable, at least, to that enjoyed by industrial workers in the community in which he lives. He belongs to the Eagles or Moose or Elks. He listens to Amos and Andy and he goes to the movies on Friday nights. He subscribes to a newspaper and a magazine or two,

and he follows the antics of Moon Mullins and Andy Gump. He digests the headlines from Russia and China and North Africa, and he knows what Pete Reiser's batting average was in 1942. In fact, he lives the normal life of an industrious, relatively sober American wage-earner.

While he may be no economist, he does know that his own well-being and the well-being of his family depend largely on the quality and quantity of the timber resources of the Northwest. He knows that his earnings are better than those of lumber workers in any other section of the nation because the timber resources from which he derives his livelihood are better. He knows that



No longer is the lumber worker a wild, unwashed individual. Today he is an industrious wage-earner with a deep-rooted interest in timber resources and the industry they support



His way of life has been greatly improved. Even in his woods camp he enjoys the advantages of radio, of an automobile, of newspapers and magazines, of wholesome food, of good fellowship

timber products from the Northwest, despite higher wages and higher transportation costs, can compete in all markets at home and abroad because of their quality, quantity and availability. He knows that once the timber in which he works becomes scarce, inaccessible and of inferior quality, not only his relatively decent wage scale but his job as well is jeopardized. Therefore, he is keenly interested in orderly cropping and adequate reforestation.

His stake in the timber resources of the Northwest is great. The operator moves in, cuts the timber, and, if he is efficient, derives enough profit therefrom to enable him to move to a new locality when the timber is gone, or to invest his profits in some other line of endeavor.

The worker, however, has no advantage of this kind. When the timber is gone he faces the prospect of either finding another job in the locality where he has established his home, or uprooting his family and moving to a new section of the Northwest where timber is more plentiful. Whichever course he chooses, he knows the way will be hard. Generally lumbering is the life-blood of a community. Once lumbering is finished, other kinds of jobs also become scarce. Nor is moving to a new locality an easy matter. Property must be disposed of, old friends must be left behind and in unfamiliar surroundings a new life must be built up.

No wonder, then, that the Northwest lumber worker is taking more and more

interest in forestry and forestry problems. He discusses forestry at his union meetings and he joins the civic organizations that are interested in perpetuating and preserving timber resources. He takes an active interest in fire prevention work and he tries to educate others into doing the same.

With the war effort making heavy demands upon the timber resources of the Northwest, his interest in good forestry practice increases. He is fearful lest good forestry practices be abandoned entirely in the interests of added production. He realizes that the additional pressure of wartime demands may relegate orderly cropping to the background, and he looks askance at every

(Turn to page 262)



The lumber worker knows that his own well-being as well as that of his family depend on timber resources. That is why he is in the forefront of any movement to preserve and extend them



Fire is the greatest enemy of the forests of the Northwest. Until brought under reasonable control it hangs as a threat to all plans of forest management—public and private alike

Grim, hard-muscled fire fighters of pre-war days whose ranks have been thinned by calls to the armed services and to the war industries

ENEMY FIRE!

By JOHN B. WOODS

THE Pacific Northwest is at war and one exacting part of the war effort is the protection of its forests, farms and rangelands from fire. The news of Pearl Harbor was a signal for all regular protection agencies to begin planning for an expanded, but at the same time intensified, coverage of danger spots during the 1942 fire season. They accomplished wonders in the face of reduced manpower. And so did the people of the region. Behind the 1942 overall record for Oregon and Washington of fewer man-caused forest and farmland fires than ever before, is the indisputable fact that more people were being more than ordinarily careful in the open where their carelessness might start fires.

By and large, the Northwest is believed to be in pretty fair shape to protect itself this season against the enemy, fire. Yet, significantly, the War Department, in announcing a Civilian Protection School to be held at Seattle, calls attention to the fact that the only aerial attack made against continental United States has been upon the forests of the Northwest. Although forest defenders were alert and no damage resulted, the fact that incendiary missiles were



AMERICAN FORESTS

dropped on Oregon soil acts as a preventive of complacency among protection agencies.

The manpower situation is still acute. Last year the various agencies joined in a recruitment program in colleges and high schools, and thus obtained upwards of 2,000 husky youngsters who were trained as lookouts, patrolmen and fire crew members. This method must be followed in 1943; in fact, training classes are already being organized through the Northwest.

An axiom of protection people is that fires which do not start need not be fought. Another is that the great forest catastrophe almost never happens suddenly; instead it develops during a period of days or weeks by multiplication of small fires which grow larger while protection forces are being worn down and spread more and more thinly. Then may come the tragic combination of low humidity and high winds to sweep the flames entirely out of human control. One clear way to avoid catastrophe would be not to have any fires anywhere, any time. Unfortunately this cannot be arranged. Even if men were to stop striking matches or using spark-emitting machines, there would still be lightning to hit tall trees.

A second-best way is to reduce the number of fires caused by humans and, happily, experience has shown that by constantly reminding the public to be careful, progress can be made. Since 1940, intelligently planned and adequately financed prevention campaigns have been carried on in Washington and Oregon, aimed at people who are careless by habit or indifferent to outdoor fires because of long familiarity, people who must operate hazardous machinery in forest and field, and those who, from malice or natural cussedness, insist upon setting things afire. The results of these campaigns have been remarkable in both states. People have reacted by consciously exercising care.

Organization of youth into a Green Guard has been a highly successful phase of this project. What Northwest boys and girls are accomplishing is graphically set forth by fourteen-year-old George Johnson, who lives near Coquille, Oregon. George was captain of a Green Guard unit in 1942 and his task was to report the activities of his group as young protectors of farms and forests during the critical summer. All over Oregon boys and girls were preparing similar reports to be submitted in a round-up contest, the winners of which would enjoy a four-day outing in the high Cascades.

So, one evening in early September, George took his pen in hand and wrote: "I would like to enter your contest. There are five of us in our Green Guard

club and I'm the only one trying for the trip. Well, one of the first things we did was to build a lookout on top of a stump on Bird Mountain. The area which we cover is about nine miles south, four miles north, seven miles west and nine miles east. The first boards we carried up for our lookout we didn't think we would ever get there. But after the first time it was not so bad.

"If a fire is sighted, we flash down to a member of the club with a mirror and he warns the fire department. Mr. Beyers, a fire warden, lives next door to me and he is going to help me fix a real fire-finder for next summer. Then it will be easier to locate a fire. He took us up to Beaver Hill Lookout and showed us how to use a fire-finder.

"Some other things we have done to help Keep Oregon Green: we put up some signs along the highway. These signs read 'Don't throw burning trash away that will start fires.'—'Be sure your campfire is out.'—'Never throw a burning cigarette in the brush.'—'Help Keep Oregon Green.' Every time I see a man light a cigarette, I tell him to make sure his cigarette is out when he is finished and to watch where he puts it. Well, I guess that is about all. Anyway we didn't have any fires, so goodbye."

There were many other letters from Green Guards, describing the ways in which they had fulfilled their enlistment pledges to protect the farms and forests of their state, and to think protection, talk protection and practice protection against fire.

In some of these youthful reports there may have been a note of disap-



From this lookout on Mt. Emily in the Siskiyou National Forest of Oregon, observer Howard Gardner (seated) sighted and reported the forest fire resulting from the first aerial bombing attack by Japs on continental United States



During the war all classes of Northwest citizens, including youth organized as "Green Guards," serve as vigilantes of fire protection

pointment because so few fires had occurred to test Green Guard efficiency. This was understandable, since boys and girls crave action, especially when they are all set to act. Yet on thousands of farms and ranches, these youngsters had carried out systematic fire hazard checks in and about buildings, along roadsides and in fields and woodlands. They had helped to eliminate many such hazards. Some had fought grass and wheatfield fires alongside fathers and brothers enrolled in adult rural protection units. Others had packed tools and water to forest fire crews.

Six thousand young Oregonians bustled about, thinking, talking and practicing prevention; pestering their easy-going parents with plans for cleaning up around buildings and in fence corners; offering sage advice to cigarette smokers; and tacking homemade or printed posters to roadside trees. Of course they got in people's hair, but that was good, for they caused those people to think with new directness regarding the perennial and statewide danger of conflagration. And fire is like sin; when one thinks about it seriously enough to take a position, one must be "agin'" it.

Backing up this broad regional campaign of fire prevention, state and federal authorities "got tough" in the matter of public use of forests. In normal times, fire protection officers expect that careless berry pickers, fishermen, hunters and picnickers will set a considerable number of fires for them to put out. In 1942, the freedom of such people to roam over forest lands was drastically curtailed; hazardous areas were closed to all who had no urgent business therein. Fishermen were restricted to stream banks which could be patrolled; elk and deer hunting seasons were postponed, or in certain cases cancelled. Either because of an adequate publicity build-up or the patriotism impulse, or both, few of the people who were thus deprived of traditional privileges voiced any serious objection.

Another longstanding abuse, which was summarily ruled out in 1942, was the free-hearted habit of stump ranchers to set piles of brush afire and then permit such blazes to get away and endanger other property. The Army demanded that there should be no smokes to hinder aerial activity. Therefore, no brush disposal permits were issued during the summer, and no rancher fires escaped to aggravate the forest defense problem. Such experiences point to the common-sense conclusion that similar restriction during seasons of high hazard would be desirable always,—even in time of peace.

Whether it is obtained through "boughten" publicity, patriotism, or forest closures, prevention is never quite perfect. In normal times, some fires do start from such causes as human carelessness, logging railroad operation, and lightning. In war time, sabotage and enemy attacks are added threats. To detect blazes at once and to suppress them promptly are the tasks of protection agencies. The general objective is, of course, to prevent development of



Forest fire-fighting truck in action

conditions which may result in catastrophe.

In peace time, regular forces must be of sufficient strength and properly disposed to handle within a few hours any number of fires which may start. In the present emergency, it is desirable that many people, living in the rural districts, be trained to detect and deal with incendiary leaflets or bombs. Such special preparedness ties in with civilian defense measures in rural communities. It also accounts, in part, for creation of the Green Guards and similar volunteer groups. Curiously enough, it was the force behind a long overdue organization of rural protection units which in 1942 enlisted more than 10,000 Oregon farmers and wheat growers.

Forest protection in Oregon and Washington is about thirty years of age. The forest areas of the two states are fairly evenly divided between public and private ownership, which means that half of the protection job is done by the U. S. Forest Service, the Indian Service and Park Service, while the other half is carried on by state forestry departments and private patrol associations.

There has long been close cooperation among federal, state and private protection forces, involving joint use of

certain facilities, such as lookouts and phone lines. It is further exemplified by exchange agreements under which one agency protects scattered holdings of the others lying within its boundaries. Possibly the most notable example of private protection of federal lands is in Oregon, where nine private associations and one state force protect 1,700,000 acres of Oregon and California Revested Grant Lands. Incidentally, the remainder of this Interior Department holding is protected by the Forest Service.

These regular patrol forces look after the great bulk of the forests in both states, including reserves of ripe timber, growing stands and released cutover areas. Logging operators are charged with protection of lands where they are harvesting the tree crops until they have complied with state slash disposal laws. Farm fields and other rural areas outside organized forest protection districts have long been a source of woe for protection agencies, since the latter were often called upon to fight fires in such places, usually without reimbursement.

In 1941, the Oregon Legislature passed laws to permit organization of rural fire districts, to be financed through local taxation. To this legislation there was some slight response. Far more spectacularly, in 1942, the Secretary of Agriculture at Washington instructed farm extension people to undertake to form rural fire fighting units and to help them equip themselves with hand tools, pumps, tanks, and the like. In Oregon, this project got away to a good start. Several hundred such units were formed and a number of potentially dangerous fires in wheat fields and pastures were quickly suppressed. Indications are that a similar response can be expected in Washington during 1943.

This development is particularly important, because it marks the end of a feud between foresters and farmers. For many years the farmers, particularly those owning livestock, have resented the efforts of forest protection people to prevent reckless burning of range. In their turn, the foresters have complained bitterly over the necessity of fighting fires to save crops, pastures and even buildings of obdurate farmers. Now the latter are willing to quit burning range; they fight their own fires and, on occasion, even go to the foresters' aid. Some wag has remarked that a war which could bring about this sort of conversion, cannot be altogether bad.

Looking ahead, it appeared desirable to coordinate the activities of these various protection agencies. Early in

(Turn to page 256)

AFTER VICTORY—WHAT?

By BROR L. GRONDAL

THE Pacific Northwest is economically dependent upon its forest resources. After final victory, some of the industries born of war will remain, but they will be ineffective substitutes for the forest industries that have largely built up the region. So, what of the future? Can the forest products industries survive in the face of a steady and rapid depletion of the virgin stands of timber? Can the region promise employment to the thousands upon

thousands of defense workers who have flocked to this corner of our country and who will, presumably, wish to remain permanently?

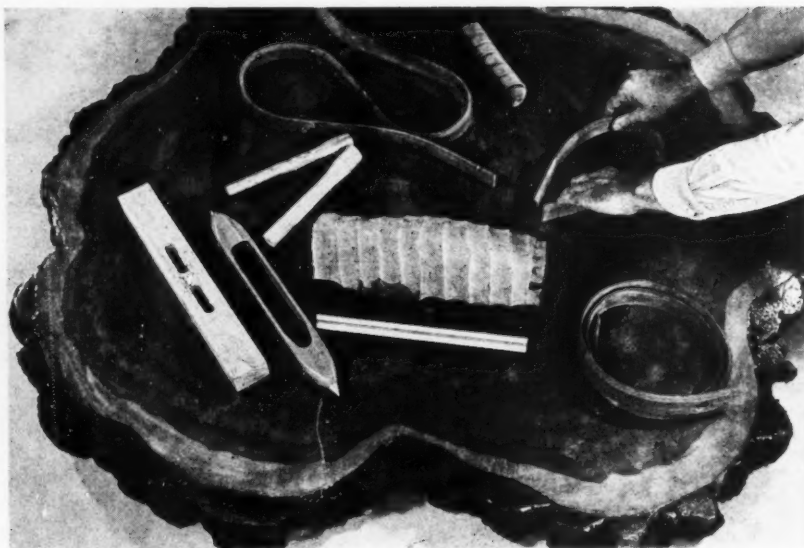
The forests that are contributing so heavily to the war effort at this moment are privately owned; the major depletion of timber is in private holdings. Enormous quantities of virgin timber in the national forests, parks, monuments, and other federal reservations will remain. Will these be called upon



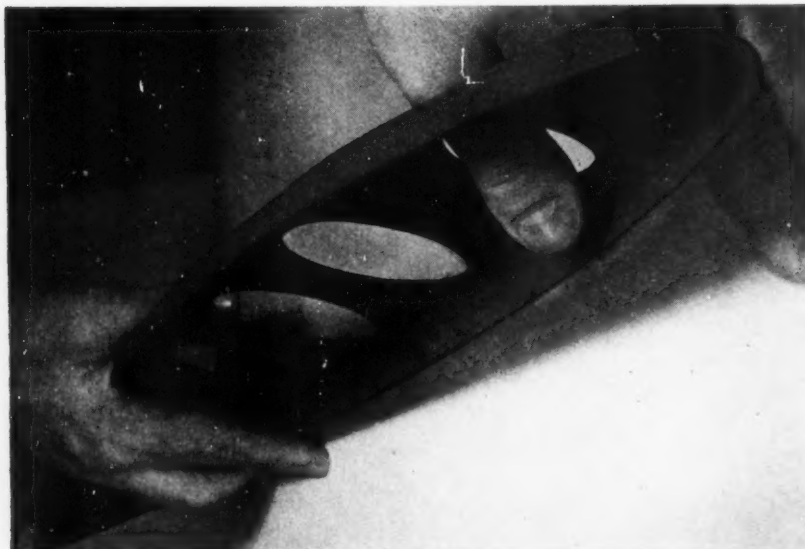
A fightin' tree — and a noble one. Rightly named noble fir, its clear, sky-reaching trunk is furnishing straight grained timber for our airplane armadas. Left—man-made big timbers, built up by laminating one-inch boards, are replacing steel in massive trusses, as shown here in a large aircraft assembly plant



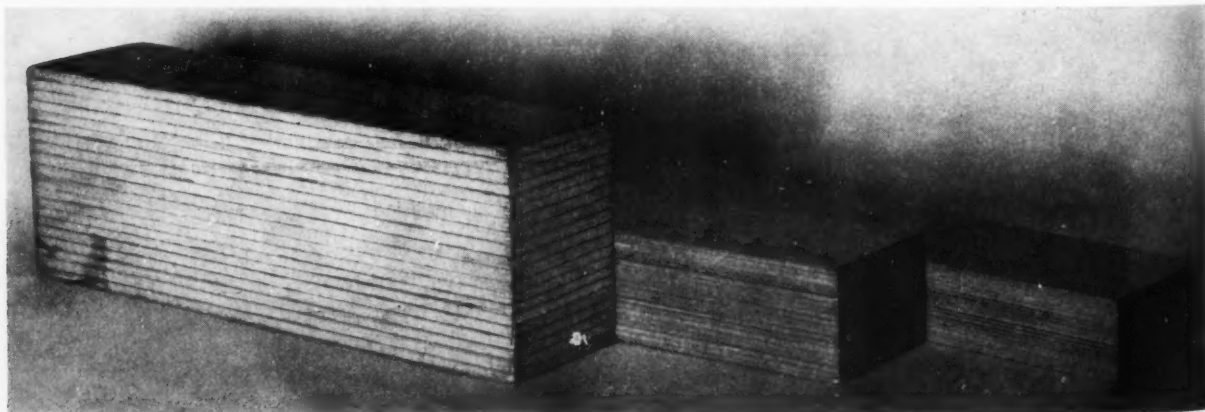
MAY, 1943



New chemical treatments of wood are widening its adaptability to use



Another new process makes airplane wing-rib from laminated paper



"Compregnated wood" is virtually as strong as steel. It is made by compressing piles of boards, as shown above, into a dense, solid mass

to carry some of the load? They contain much of the "big timber" of the future.

Without considering this timber, what about depleted private timber holdings? Even at the present rate of cutting, it would be impossible to log all of the big timber before victory. Enough will be cut, however, to increase the cost of reaching the less accessible stands that remain. This may well mean that the day of very cheap "big timber" is over. It means also that in the future, many forest industries now in existence will have to readjust themselves to the utilization of small logs or "pee-wees"—already a standard log grade in the Douglas fir region.

How can the forest industries make this readjustment? How are they planning for the future? How can the shock that will inevitably come be cushioned?

Present planning is insufficient. It will not solve the problems of the relatively near future. Most of the research that is being conducted is properly related directly to the war effort. Regardless of cost, we must win the war, and new ideas and methods that will help to solve future problems must be, necessarily, by-products of war-industry research. After our military victory, there may be little or no capital available for immediate expansion of research or for the development of new ideas. That, again, is a problem that must be solved, as war problems are being solved today.

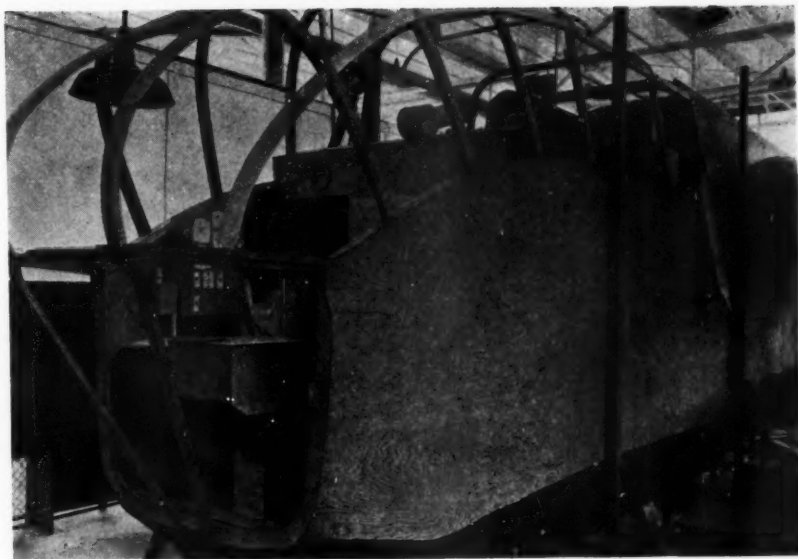
There are some by-products of research that can be counted on rather heavily. One of the most important is binding material. Call it glue, if you like, and improvement of gluing techniques. In the future, we will make a large percentage of the larger structural units for which big timbers were used in the past, from small units. Even ordinary lumber will be laminated. We will use good, inexpensive binders that will be exceedingly strong and resistant to moisture, heat and decay-producing

organisms. Research in this field is today being pushed intensively by large governmental agencies, such as the U. S. Forest Products Laboratory and by manufacturers of glue and wood products.

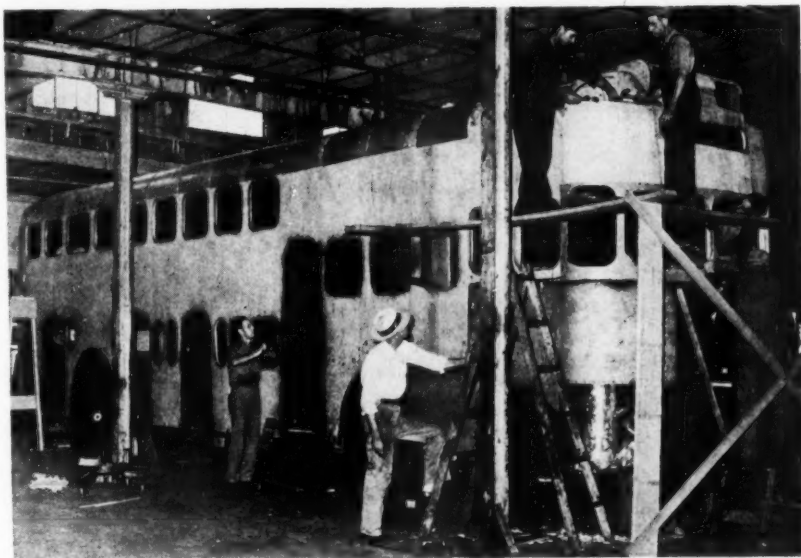
Aircraft construction demands ever-better glues that must be approximately as elastic and plastic as the wood they bind. While truly ideal glues have not yet been found, they are in the offing. Large glue manufacturers — the largest factory for the manufacture of vegetable protein glues in the world is located in Seattle—maintain correspondingly large staffs of research workers. The laboratory of the Douglas Fir Plywood Association is continuously engaged in the checking and testing of new glues and tests on glued material are being made in the laboratories of educational institutions such as the University of Washington. Plastic airplanes are in the skies—but they are simply good wood properly glued.

Plywood manufacturers are all following the lead of those who installed "hot presses" for setting thermoplastic glues. The jointing of edges of veneer and the gluing of relatively narrow widths of veneer together, edge-to-edge, with heat-setting thermoplastic glue to form a continuous sheet that can be clipped to standard widths is now quite ordinary practice. In at least one plywood plant the glue lines in plywood are set electrically or rather by the heat generated by ultra-short radio waves, and the use of a similar method, employing portable apparatus, has been suggested for the field-gluing of joints in structures, to avoid the use of bolts or nails.

One of the largest manufacturers of lumber in the region is gluing short lengths of two- by four-inch lumber together endwise, using an ingenious splice that insures great strength, thus producing with a minimum of waste studding of any length. Still another manufacturer has found it highly profitable to



Douglas fir plywood builds a plane model, even including the frame



Plywood-covered bus, to carry 117 passengers, in course of construction



And the finished product — one of the fleet of smart new Victory liners,—exterior, interior partitions and floors, all built of plywood

"seal" knots in ponderosa pine lumber so that they will remain tight and unbroken when the lumber is surfaced in a planer. This is done in a cleverly designed machine which applies glue locally and momentarily to the knot under a pressure of four thousand pounds a square inch.

"Compregnated" wood, developed at the Forest Products Laboratory at Madison, Wisconsin, exhibits a tensile strength approaching that of mild steel. It is made

by impregnating wood with substances that react to form thermoplastic glue, followed by heat and pressure which forces the cell walls of the wood together, eliminating the cell cavities and compressing the wood into a very dense, solid mass. Tests on "compregnated" wood are under way in the timber testing laboratory of the College of Forestry of the University of Washington to determine its effectiveness as a substitute for steel reinforcing rods in con-

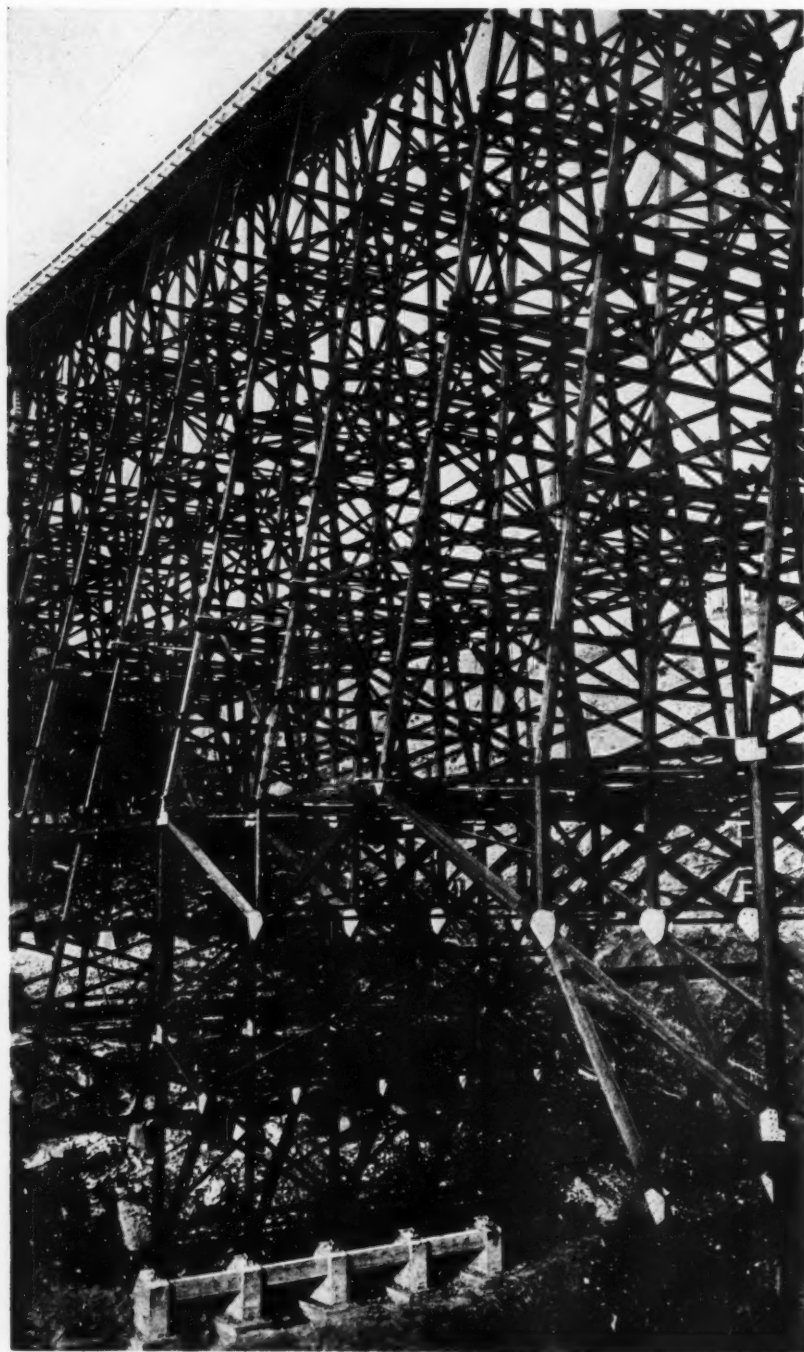
crete beams.

Tests on ordinary laminated wood made from plywood scrap and glued by modern methods have recently been completed in the same laboratory for a large logging firm. Funds have been allocated to the same institution by the Washington State Planning Council, with the approval of Governor Arthur B. Langlie, to test a new type of machine that promises to produce a very superior grade of rotary cut veneer. In this laboratory, an extended series of tests on heavy laminated floor sections, from four inches to twelve inches in thickness and fourteen feet long, conducted in cooperation with the West Coast Lumbermen's Association, will soon be completed. Data obtained from these tests appear to be applicable to floor-slabs made of a variety of materials as well as wood.

The production of large beams or timbers from lumber of ordinary dimensions is no longer in an experimental stage. Cold-setting synthetic water-resistant glues which exhibit very high strength values are available in unlimited quantities. A glue of this type can be spread on a plank using a hand-spreader. Another plank is placed on the glued surface and nailed down. Plank after plank can be applied in this manner to produce a beam or post of any desired cross-sectional area and length. Curved arches can be made by bending the planks around forms as they are glued up. This type of beam is now rapidly becoming "standard" in construction work.

It is generally recognized that one of the greatest advances in the use of wood has resulted from the application of "ring connectors," particularly in the prefabrication of trusses and other structural components of buildings and bridges. The large, modern wood preserving plants of the Pacific Northwest are today pre-framing immense quantities of material before treatment with creosote, zinc chloride or other preservatives. One large sawmill company in Tacoma, after suffering the partial destruction of the mill by fire, abandoned the production of lumber and converted the mill into a giant prefabrication plant for the use of lumber. This plant is now too busy with Army and Navy orders to plan, definitely, for the future, but as soon as victory has been achieved, it will be ready for standard commercial orders. In this plant, ring connectors have even been used successfully in the construction of water storage tanks, in

(Turn to page 268)



A highway bridge—modern masterpiece in timber trestle construction,—1,130 feet long, 235 feet high—made practicable by split ring-connectors at each joint

Editorial

"Industrial Forestry in Progress"

FROM its beginning, and down to the present day, forest conservation in America has consistently placed its public emphasis on the destructive side of forest management by private owners of timberlands. This form of public education was born in the early days when in order to obtain federal and state laws looking to the protection and conservation of forests it was necessary to arouse and alarm the public over the destructive methods employed in harvesting the resource. Maintenance of forests and their manifold influences being matters of public concern, the technique was justified on the ground that the average American knew little of what was going on in the woods and a form of education was called for that would shock him out of uninformed complacency.

In the course of years the propaganda principle of keeping the dark side of the forest picture always to the front for public consumption yielded results. Slowly and step by step, policies and agencies of forest conservation were established by the federal government and by the states under the pressure of an awakened public consciousness that forest protection and better management of forests are questions of great public concern. Whether more progress and a greater degree of public cooperation could have been achieved by employing a less dark-sided method of education might be argued but it is one of those unanswerable questions that is of no moment today.

The subject would not warrant mention here even in a brief way except for the influence which the policy has had and still has on present methods of public education regarding forestry progress on private lands. Fifty years of stressing and playing up the destructive side of forest ownership as a private enterprise has hardened, we think, into a conservation tradition which neither the forestry profession nor leaders of the conservation movement have been able or thought necessary to shake off or modernize. The

result is (1) the public is not being fully informed regarding the progress of forestry in the woods by private owners and (2) forestry, by playing down its progress in fields of private endeavor, is losing opportunities to expand its services and to enhance its public standing as a profession of accomplishment.

Modern education and public relations cast aside long ago dark glasses and the negative front. Accomplishment is a far greater instrument of public stimulation and cooperation than lack of accomplishment. Furthermore, there is the consideration that the public ethically is entitled to a balanced picture of how the forest resources of the nation are being handled by both public and private owners.

All of which raises the question if a profession which persists in placing major emphasis on what is *not* being done in its field and remains blind-sided to what *is* being done, is in good health and mentally alert to opportunities of greater service to itself and to forest owners who would be attracted to its practice by an outlook of success rather than one of failure. Medicine has not risen to its high place by bewailing the lives it has failed to save, nor engineering by beating its breast over the bridges it has failed to build.

The practice of forestry by private owners is the largest and most important field for the development of the profession. Likewise it is the most important from the standpoint of public interest and the maintenance of private enterprise in the growing of forests and their conversion to essential products. Every acre of private land that is brought under improved forest practice is a feather in forestry's cap and it ought not to be hidden in the dry leaves. When an individual or a corporation brings an extensive area of forest land under management that accomplishment ought to equal in publicity value that accorded the establishment of a state or national forest. But it does not. The explana-

tion would seem to lie in the tradition that progress in the woods where progress really counts is best made not by capitalizing on success but by keeping the worst side forward in order to pass another law.

During the last twenty years, forestry has moved forward and widened in the privately owned forests of the country. The extent of its progress, even the foresters themselves admit they do not know—a commentary that speaks for itself. As illustrative of progress in the private woods, AMERICAN FORESTS in this number devotes its pages to a presentation of industrial forestry in the Douglas fir region of the Pacific Northwest. This is but one section in the vast spread of privately owned forest lands throughout the nation in which progress has been made. Later issues will from time to time be devoted to other important forest regions. These special issues featuring industrial forestry do not in any way imply a change of editorial policy in respect to reporting other aspects of the forest situation, good and bad. They are an effort to bring into clearer and more balanced focus the forest picture as a whole.

As respects this issue, the progress reported in broad outline is done so plainly and frankly by men who are a part of it. There is no intent to minimize the heyday of reckless exploitation in the region or its destructive aftermath. Admittedly, destructive lumbering still exists and the picture is far from completed. What is presented is a human scene and a human story of an industry and a region working out in our American democratic way a process of change from forest exploitation to a sustained yield form of forest management. In spite of the war and economic handicaps too numerous to mention, the process continues to go forward with a momentum of success that is welding public support, enthusiasm and cooperation throughout the region. This is industrial forestry in progress.



*Giant arborvitae
of the Olympics*

Tree Trails . . .

Monarchs of the Pacific Northwest

OLD lumberjacks out on the Pacific Coast like to tell about a Douglas fir cut in British Columbia some years ago that lifted its mighty crown 400 feet into the sky. Acceptance of this fantastic growth must rest upon your faith in the veracity of old lumberjacks. Documentary evidence to bear it out does not exist. But there can be no question as to the super-growth characteristics of Douglas fir, as well as other species, along the rainy coastal belt of Oregon and Washington. In this great forest region are trees of truly magnificent proportions.

The great Douglas fir standing beside the Queets River in the Olympic National Park of Washington, for instance. This monarch, with a circumference four and a half feet above the ground of fifty-three feet, four inches, is 221 feet tall—likely the largest Douglas fir in the world. At least it is the largest discovered by The American Forestry Association in its two-year search for the tree giants of the nation. It was reported in 1941 by Preston P. Macy, su-

perintendent of the park. Measurements were made by Park Ranger Oscar Kuntz.

Prior to the discovery of this monarch, a great Douglas fir on the lands of the Hawley Pulp and Paper Company near Seaside, Oregon, reigned as the largest of its clan. Its circumference is recorded as forty-eight feet, its height 210 feet, though its top, through long struggle with the elements, has been broken off.

So has the top of a giant arborvitae, or western red cedar, also in the Olympic National Park. Today, its spiked crown is barely one hundred feet above its great roots—roots which support a tremendous trunk sixty-two feet, eight inches in circumference, at breast height. This trunk circumference, by the way, equals that of the champion redwood on Maple Creek, Humboldt County, California. Taller redwoods have been reported—the highest 364 feet—but none with a greater circumference. F. W. Mathias of Hoquiam, Washington, reported the giant arborvitae to the Association. It stands in a heavy grove of

western hemlock near the shore of Lake Quinalt.

Farther south, in Coos County, Oregon, is king of the Port Orford cedars—a monarch rearing its crown 200 feet above the ground. This giant, discovered and measured by Oliver V. Matthews of Salem, Oregon, is twenty-seven feet, two inches in circumference, at breast height. Oregon also boasts the largest known noble fir. A magnificent tree near Palmer is 215 feet tall and has a circumference of eighteen feet, nine inches, four and a half feet above the ground.

But Washington claims the largest Sitka spruce, according to T. J. Carlson, of Corvallis, Oregon, who measured a giant near Beaver with a circumference of fifty feet. This monarch, however, is but 150 tall, fifty-four feet under a Sitka spruce reported on the Tongass National Forest in Alaska. But what it lacks in height is made up in girth, as the Alaskan tree is only thirty-five feet, eight inches in circumference.

A mammoth ponderosa pine on the bank of the Deschutes River near Lapine, Oregon, is rather far removed from the coastal belt where grow the giant firs, spruce and cedars. The mighty Cascade range of mountains separates it from this company of kings. Yet it deserves mention, for it is the largest

of its species so far discovered. Reported by Donald F. McKay, of Portland, it is 162 feet tall and boasts a circumference at breast height of twenty-seven feet. Another giant ponderosa pine on the Columbia National Forest in Washington is 198 feet tall, but its circumference is slightly short of twenty-one feet. The Columbia forest also claims a grand fir nineteen feet, eleven inches in circumference and 157 feet tall—the largest yet reported.

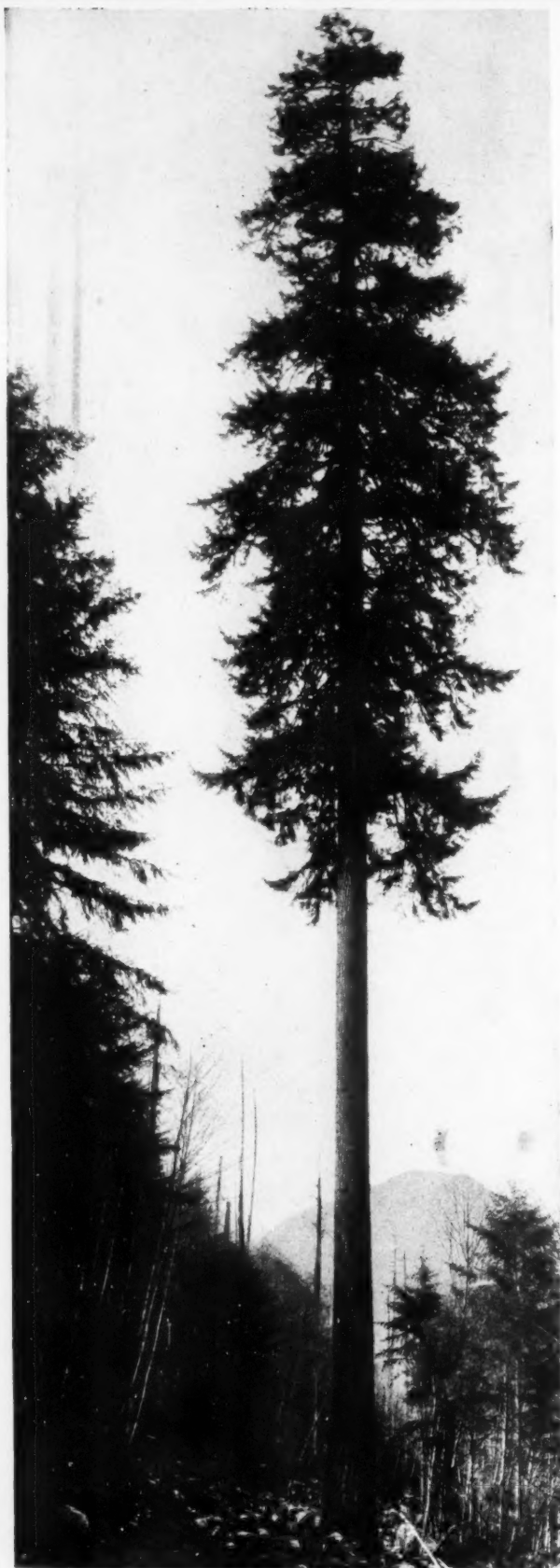
Among other tree champions claimed by the region is a California black oak near Marial, Oregon, with a circumference of thirty-two feet, ten inches; an Oregon white oak in Polk County, Oregon, nineteen feet, five inches in circumference; and a bigleaf maple in Lane County, Oregon, which is twenty-eight feet in circumference.

The Pacific Northwest, surely, is a land of tree giants.



Though forests west of the Cascades produce larger trees, the region east of the range has its monarchs—this king of the ponderosa pines for one

Largest known Douglas fir is this giant, fifty-three feet in circumference, at left, standing beside the Queets River, Olympic National Park, Washington



In the mountains of the northwest Douglas Fir attains magnificent proportions, sometimes reaching a height of over two hundred feet

DOUGLAS FIR

Pseudotsuga taxifolia, Britton

By G. H. COLLINGWOOD

DOUGLAS fir is a widely distributed tree. It grows naturally throughout the Rocky Mountains, from their eastern base to the Pacific Coast, and from northern Mexico and the mountains of western Texas, southern New Mexico and Arizona to British Columbia. It attains its largest size near sea-level in the coast region of southern British Columbia, Washington, Oregon and on the western foothills of the Cascade Mountains. No attempt is made in this description to distinguish between the Oregon variety and the slower growing but more hardy Douglas fir native to the interior mountains. It is frequently called red fir, Oregon pine or Douglas spruce, but Douglas fir is generally accepted.

Douglas fir trees attain a height of over two hundred feet with trunk diameters of ten to twelve feet, and are often characterized by a clear shaft for a third of their height. The larger trees may be from four hundred to seven hundred and fifty years old. The reddish brown bark of large mature trees is broken into oblong longitudinal plates and may be ten to twelve inches thick. The smooth thinner bark of young trees is more of the color of ashes, has resin blisters like the true firs, but thickens as the tree grows larger and becomes reddish brown in color.

The tree is in the nature of a botanical puzzle, for it bears strong resemblance to spruce and fir as well as to the hemlock and yew. Accordingly, the botanists went to the Greek to describe it as a "false hemlock with a yewlike leaf." It was first discovered by Dr. Archibald Menzies in 1791, on the west coast of Vancouver Island; later it was rediscovered by the Scotch traveler David Douglas, who introduced it into England in 1827. Since then it has been widely planted on the British Isles.

The soft, flattened, slightly pointed needles are one-half to one and one-half inches long and grow around the branch so as to give it a full rounded appearance. They are grooved on the upper surface, and have a white band on each side of a prominent midrib beneath. When pulled off they leave an oval scar on top of a little projection. They remain on the trees five to eight years before they fall. Frequently the dark orange-red pointed terminal bud is one-fourth of an inch long, while the side buds are about half as large.

The oval cones are pendulous like those of the spruce and pine. They are an inch and a half to four and one-half inches long and mature in the first autumn from reddish ovulate flowers that grow well out on the ends of the branches. The three-lobed "Neptune's trident" is especially noticeable in the blossom stage. On the same tree are the bright red staminate or male flowers, which appear in the early spring on the under surface of the previous year's growth. The thin rounded scales of the cone are thrust over conspicuous three-pointed bracts, and under each scale are two seeds, each with a single wing. The parent trees scatter these seed so effectively that they quickly take possession of burned forest areas. Trees may begin producing cones at twelve years of age, and continue with crops nearly every year.

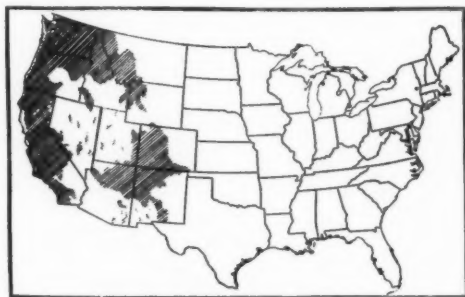
The wood is usually yellowish to light red, with a narrow band of white sapwood. It is fairly light, strong, firm and works well. Compared with other American woods it is the strongest of all in terms of weight. The

immense size of the trees permits the manufacture of timber remarkably free from knots and other defects. It is important in the lumber industry and building trade. When air dry a cubic foot weighs thirty-one pounds. It is used for all kinds of construction, railway ties, piles, etc., is resistant to decay, and can be attractively stained for interior trim. Recent estimates indicate that American forests contain 490,000,000,000 board feet of Douglas fir sawtimber, of which most is in Washington, Oregon and northern California. Douglas fir is second only to yellow pine in volume of annual production, and the present stand comprises about one-fourth of the remaining sawtimber in the United States. Before the war, the annual cut of fir was 6,500,000,000 board feet, with the State of Washington leading. During 1941 and '42, war demands for wood increased the fir cut to over 8,000,000,000 feet.

Douglas fir may be grown from seed under nursery conditions, and successfully transplanted to forest plantations. Under natural conditions it grows from sea level where more than 100 inches of rain falls each year, to altitudes of nearly 11,000 feet where the annual precipitation is fifteen inches. In deep loam soils it develops widespread root systems. In moist well drained soil trees will grow to a height of thirty-five feet in twenty-five years. The trees prefer northern and western exposures, but will withstand wind fairly well and endure considerable shade. The small trees are hardy and attractive for ornamental planting in the northern and northeastern states as well as in the West. Being moderately tolerant of shade, they hold their branches down to the ground unless heavily shaded.

They may be planted close together and pruned for hedges. The symmetrical young trees whose soft rich green needles hang on long after the tree is cut down are being used in increasing numbers for Christmas trees and holiday decoration.

Douglas fir is particularly subject to fire damage during its early years, but as the bark grows thicker it becomes increasingly resistant. Not only does fire destroy many trees, but it also causes unfavorable soil conditions, and the fire scars furnish places where insects and fungi may enter. It may be attacked by a long list of insects, fungi and mistletoe but is little affected by most of them. The worst insect enemy is a beetle which bores between the bark and the wood, frequently killing the tree. Periodically the western hemlock looper destroys considerable merchantable timber, and eastern plantations have been threatened by a larch canker, but taken as a whole such losses are comparatively small.



Natural range of Douglas Fir in the United States

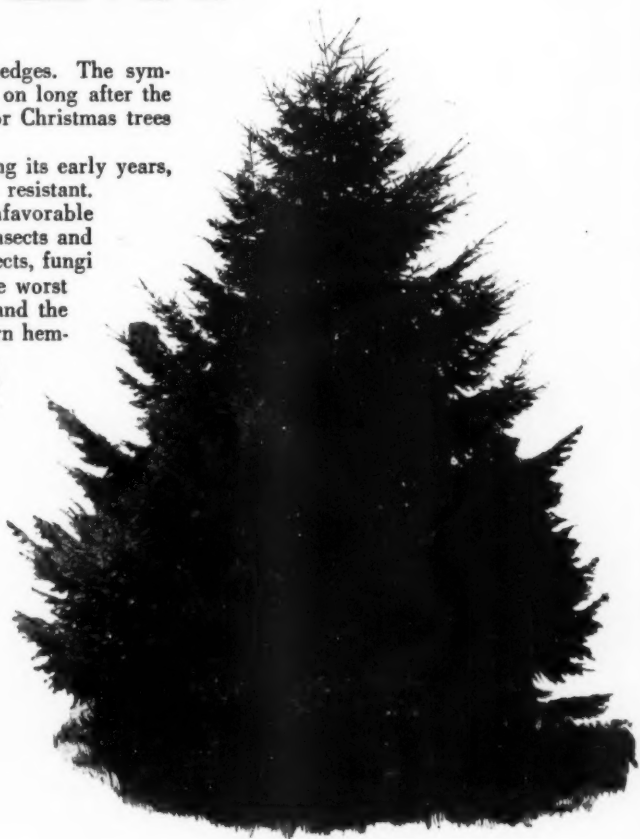


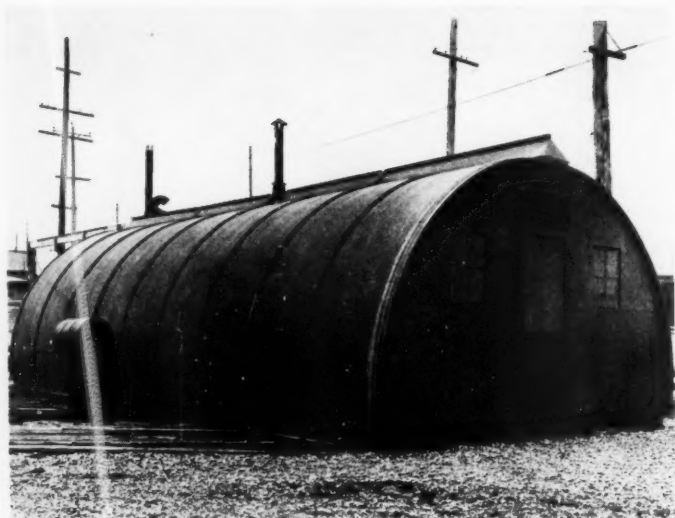
The reddish brown deeply fissured bark of mature trees is sometimes a foot thick



Above:—The three-pointed bracts extending beyond the cone scales, the flexible bluntly pointed green needles, and dark orange-red winter buds combine to help identify Douglas Fir

Below:—In their youth Douglas firs are dense-foliaged and symmetrical. They are planted over a wide area to decorate home grounds, for windbreak purposes and for future stands of timber





The Pacific Hut, product of spruce, fir and hemlock forests, protects from extremes of heat or cold

THE PACIFIC HUT

Wood Shelters for
Our Fighting Men
Around the Globe

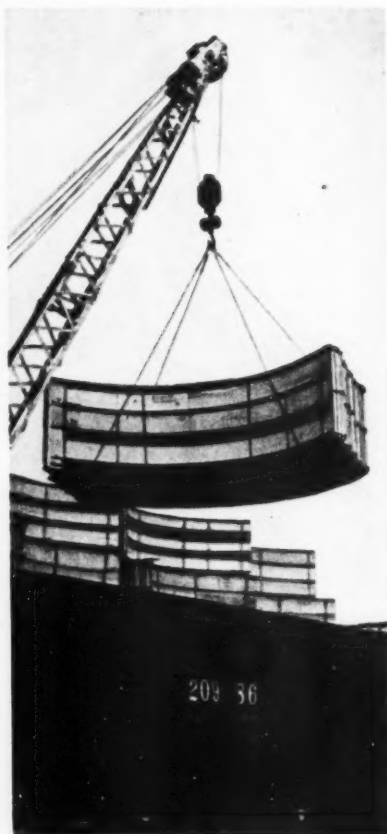
PACIFIC Northwest wood is fulfilling 1,200 separate missions in the war effort. None, however, is contributing more to victory than the wood that goes into Pacific huts, manufactured by Pacific Huts, Inc., at Seattle, Washington. Wherever American soldiers go, they must be protected from extremes of heat or cold as well as from insects, wind and sand. On a dozen different battlefronts these huts are doing these things effectively and efficiently.

Every few minutes, day and night, Pacific Huts, Inc., turns out a hut capable of housing from sixteen to twenty men in comparative comfort. These huts have withstood temperature extremes ranging from 120 degrees above zero to seventy degrees below. Shipped in knock-down form, they are easily assembled in a few hours by even the greenest novice; this means that wherever our troops land in the morning, by noon they are comfortably and adequately housed. The compact manner in which the huts are crated means a tremendous saving in shipping space.

How many tons of critical steel and iron have been saved for other uses in the war effort through the effectiveness of Pacific huts remains a military secret. That it is no small amount is indicated by the thousands upon thousands of American and allied soldiers who are living comfortably in these huts from Iceland to South Africa.

Nowhere outside of Detroit has mass production reached the heights that it has in the manufacture of these huts. With a precision known to few assembly lines, spruce, hemlock and fir enter one end of the plant to emerge a few

hours later drilled, framed, crated and ready for shipment to any part of the world for quick assembly into compact, comfortable barracks. Laminated strips



Shipped in space-saving sections, it can be assembled in a few hours

form the ribs of the huts; wallboard forms the interior and exterior; plywood forms the floor. An inch of insulation between the inner and outer walls effectively keeps out heat or cold.

In one department of the Seattle plant, thin strips of Northwest wood are cut to size and laminated. A hydraulic machine bends them to rib shape and places them into a form where they remain overnight to dry. The next morning they go onto the assembly line where the interior and exterior wallboard is applied after an inch of insulation is nailed and glued. Each process is simple and error-proof. Even the places where the nails must be driven are marked.

In another department the sills for foundations are made. Here, also, all chances for error are eliminated. Templates eliminate all guesswork.

The Pacific hut is the brain-child of Frank Hobbs of Seattle. His engineering skill devised the assembly line methods and his understanding of human nature and human beings accounts for the remarkable production record. Although located in one of the most critical labor areas in the nation, his company has no manpower problem. Labor turnover is extremely low. Absenteeism is almost non-existent.

When the deeds of this war have become history, one of the brightest pages will be the part that Northwest wood played in the war effort. And one of the brightest paragraphs on that page will be the contribution of Pacific huts to the health and comfort of our soldiers on the battlefronts of the world.—Peter E. Terzick.



Wood serves both guns and butter

IN THE PACIFIC, "crash" boats are ready to pick up fliers whose planes have become useless—alert P.T. boats are ever-ready for their many assignments—and giant cargo planes are carrying food and munitions in the job of supply—all these instruments of war are made of wood.

Wood serves the guns—as airplane hangars, sentry boxes, pontoon bridges, landing barges, wood decking and crating for the material of war.

Wood also serves in the production of butter, and other dairy products, of poultry, meats, fats and fibre.

Wood houses America's number one industry in dollar volume—the production of food. Brooder

and laying houses for poultry, Farrowing houses for hogs, Barns and sheds for dairy, beef cattle and sheep. Wood cures the crops and preserves its feeding value. It houses the farm family and protects expensive farm machinery.

Wood was ready to meet the gigantic tasks imposed on its basic value and versatility. Wood will be ready to meet the days of reconstruction and peace time living, because private management and research assure not only a perennial crop of timber, but a more efficient and more economical use of America's best building material.



CONSERVATION IN CONGRESS

IN reporting the Department of Agriculture Appropriation Bill for the 1944 fiscal year, the House Appropriations Committee made decreases in regular Forest Service items amounting to more than \$2,500,000 as compared with the President's budget estimates. The cooperative forest fire control item, authorized under the Clarke-McNary Law, was reduced \$1,498,000 to a \$2,492,000 total, while forest products research was reduced to \$800,000, a decrease of \$140,000 and nearly \$200,000 less than is available for this purpose during the current fiscal year. Other reductions include national forest protection and management, \$415,000; forest management research \$215,000; range investigation, \$91,970; forest survey, \$89,400; forest economics, \$37,580; and forest influences, \$50,970.

The Committee consolidated the item for private forestry cooperation with the item for cooperative farm forestry under the Clarke-McNary and Norris-Doxey Acts, and for these activities recommended \$646,168, a reduction of \$161,942. This reduction consists of a cut of \$11,942 for private forestry cooperation and \$150,000 in Norris-Doxey funds for assistance to farmers in harvesting, marketing and utilization of farm wood products. The amount estimated by the Budget for the Norris-Doxey Act is \$547,368, and the \$150,000 cut leaves a balance of \$397,368.

The item for national forest roads and trails was reduced \$1,241,500 to a \$2,537,000 total, and the emergency rubber project \$1,223,000 to a \$13,048,000 total.

White pine blister rust control received a cut of \$46,342 to a total of \$1,900,000. Although Dutch elm disease eradication was left at \$333,330, gypsy and brown-tail moth control was cut \$13,000 to a \$350,000 total, and forest insects \$39,700 to a \$150,000 total. Forest pathology was reduced \$5,000 to a total of \$239,100, while naval stores investigation was increased \$3,000 to a \$115,000 total.

The item for operation of the Soil Conservation Service was cut \$3,368,000 to a total of \$18,675,000.

After passage by the House, the Department of Agriculture Appropriation bill will become before the agriculture sub-committee of the Senate Appropriations Committee, consisting of Senators Russell of Georgia, Hayden of Arizona, Tydings of Maryland, McCarran of Nevada, Bankhead of Alabama, O'Mahoney of Wyoming, Truman of Missouri, Chavez of New Mexico, Mead of New

York, Nye of North Dakota, Gurney of South Dakota, McNary and Holman of Oregon, Smith of South Carolina, and Wheeler of Montana.

Senator McNary's bill, S. 45, providing for an authorization of \$9,000,000 for cooperative forest fire prevention under the Clarke-McNary Law, will no doubt be reported to the Senate by the Agriculture and Forestry Committee in the near future. Of particular interest to the Pacific Northwest is that similar action is scheduled on S. 250, authorizing the Secretaries of Agriculture and Interior to enter into cooperative sustained-yield units with forest land owners.

Transfer of that part of the Fish and

Wildlife Service relating to the fishery industry from the Department of Interior to the Department of Agriculture is provided in H. R. 1766 and S. 687, introduced by Representative Bates of Massachusetts, and Senator Pepper of Florida. Public hearings on H. R. 1766 will begin on May 13. The House agreed on January 21 to continue the Special House Committee to Investigate Conservation of Wildlife, as contained in House Resolution 20. The Senate on April 2, agreed to continue its Special Committee on Conservation of Wildlife Resources, as contained in S. Res. 105.

An item of \$1,719,300 for fighting and preventing forest fires on national forests during the 1943 fiscal year is contained in the First Deficiency Appropriation Act, which was enacted by the House on February 26, the Senate on March 12, and is now Public Law No. 11.

CONSERVATION CALENDAR

Important Bills in Congress With Action
February 8—April 13, 1943

Bills Enacted

S. Res. 105—Clark, Missouri—Providing funds for the continuation of the Special Committee on Conservation of Wildlife Resources. Passed Senate April 2, 1943.

H. R. 1975—Cannon, Missouri—First Deficiency Appropriation bill for 1943. Passed House February 26, 1943. Passed Senate March 12, 1943. Signed by the President March 18, 1943. Public Law No. 11.

Appropriations

H. R. 2481—Tarver—Making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1944. Submitted with a report (No. 354) by the Committee on Appropriations April 13, 1943. Referred to the Committee of the Whole House on the state of the Union.

Governmental Functions

S. 764—Tydings—To establish a joint committee of Congress to conduct studies, make analyses of and evaluate requests for appropriations. Introduced February 25, 1943. Referred to the Committee on Appropriations.

H. R. 1993—Murdock—To authorize the Secretary of the Interior to conduct experiments in the revegetation and reforestation of the public domain and authorizing an appropriation for said purposes. Introduced February 25, 1943. Referred to the Committee on the Public Lands.

Grazing

H. R. 2197—Peterson, Florida (S. 938—Hatch)—To provide for the acquisition of lands for grazing purposes. Reported with amendment (No. 338) by the Committee on the Public Lands April 1, 1943.

Payments to States

H. R. 2122—Ellsworth—To provide for a uniform method of payments to the several states on account of certain lands of the United States. Introduced March 9, 1943. Referred to the Committee on the Public Lands.

Public Lands

S. 736—O'Mahoney—To promote the mining of minerals on lands acquired by the United States. Introduced February 18, 1943. Referred to the Committee on Public Lands and Surveys.

H. R. 1047—Mott—For the relief of the State of Oregon, Department of Forestry of the State of Oregon and certain organized protection agencies in the state for protection of unappropriated public-forest lands, intermingled with Oregon and California lands from July 1, 1938 to June 30, 1939. Passed House February 19, 1943. Placed on Senate calendar February 22, 1943.

Water and Stream Control

H. R. 2251—Spence—To create a Division of Water Pollution Control in the United States Public Health Service. Introduced March 22, 1943. Referred to the Committee on Rivers and Harbors.

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- Airplane Engine Cowling Assemblies
- Trackers Gun Loaders
- Marine Corps Invasion Ice Chests
- Blood Bank Refrigerators

POWER FOR VICTORY

INTERNATIONAL HARVESTER

Snohomish—First Western Forest Co-op

(From page 229)

days a year, mostly in local woods operations. During the winter, he spends another two or three months in his own woodland, cutting fuelwood, fenceposts and poles. Many enterprising dairy and specialty crop farmers know the heft of an ax and are at ease behind plow or saw.

In conservation farm plans developed for individual ranches, service foresters included management outlines for woodlands, with aerial-photo maps, stand inventories, allowable annual cuts, marketing rules, recommendations for products to be cut and assistance in planting trees on non-restocked fields.

In May of 1940, fifty farmers organized the Washington Forest Products

Cooperative Association, the first such group west of the Mississippi River and one which today is claiming the attention of foresters and forest-dependent communities in western Oregon and Washington. To the charter members, familiar with cooperative principles through their local "co-ops" for selling butter, milk and eggs, it was the logical way to consolidate forest producers with a common problem.

The articles of incorporation and by-laws of this non-profit, non-capital stock association with place of business at Everett, state its objectives as being "to improve the yield of forest lands and the income derived therefrom and at the same time establish a conservation cut-

ting policy in the interests of a perpetual crop." The association is empowered "to engage in any activity connected with the marketing, selling, harvesting, preserving, storing, warehousing, handling or utilization of any forest or woodland product, or by-products . . ." and is given the power to borrow money and to acquire forest lands and personal and real property for the benefits of the association.

Membership is open to "any person, firm or corporation engaged in the production of any forest products or owning or leasing any land on which forest products are grown and sharing in the proceeds thereof." But a conservation land-use and woodland management plan developed with the assistance of Soil Conservation Service foresters is an essential qualification.

Seven association directors, six elected by the members and one appointed by the State Director of Agriculture, conduct the affairs and management of the cooperative. Two of the present directors also are on the board of supervisors of the 407,000-acre Snohomish soil conservation district, farmer-organized in 1941, and this dual membership correlates management and planning on both conservation fronts.

The expense of maintaining the organization is met from charges provided for in the marketing agreement, which states that the net amount of individual or pooled sales shall be paid over to the growers after deducting from the delivered sale price the cost of maintaining the association, handling the various sale phases and providing reserves for depreciation, contingencies and betterments. The association also may deduct five per cent of the net returns to provide a fund for its own use, for which certificates of indebtedness are issued to the grower.

At the close of each fiscal year, the board of directors apportions the net income of the association on a patronage basis, in which the labor contribution of the grower is considered. An owner contributing only stumpage would receive a smaller share of the association's profits than one who is able to fell and buck his own timber, which is a stimulus to member participation in logging operations.

Woodland holdings of the original fifty co-op members averaged 120 acres, somewhat greater than the county figure of sixty acres. The timbered acreage totaled about 5,550, consisting of 2,665 acres of Douglas fir, 1,410 of red alder, 1,330 of western hemlock, sixty-five of western red cedar and eighty of mixed



Part-time woodsman, the Snohomish farmer is at home behind saw or plow

8 miles straight through a mountain



To an embattled America, the Cascade Tunnel on Great Northern's main line in Washington has attained new and tremendous importance.

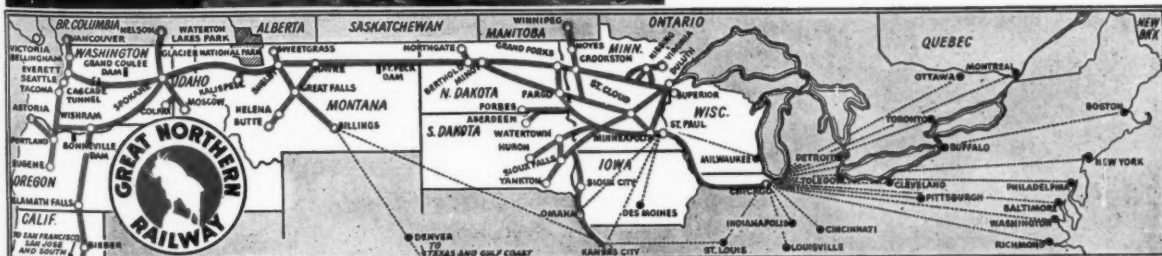
Piercing the Cascade mountain range for 8 miles, this longest railway tunnel in the Western Hemisphere permits swift, safe movement of men and material of war through rough country when speed and dependability of transportation count heavily for Uncle Sam.

Men fought stubborn, solid rock for three years in constructing the Cascade Tunnel. When the bore, straight as a rifle barrel, was completed in 1929, many time-eating, over-the-mountain miles of line were eliminated, further reducing what already was the shortest rail route between the Great Lakes and Puget Sound. A complementary improvement was electrification of 75 miles of railway through the Cascades, including the tunnel.

Symbol of never-ending improvement in Great Northern's service to the nation, this peacetime engineering achievement saves precious hours and miles in America's surge to victory.

GREAT NORTHERN RAILWAY

ROUTE OF THE EMPIRE BUILDER—BETWEEN THE GREAT LAKES AND THE PACIFIC



hardwoods and spruce, and an additional 850 acres of small reproduction. About seventy-five percent of this acreage was medium to well stocked and offered marketing possibilities.

Now two and a half years old, the co-op can take pride in conservation and marketing accomplishments in a Pacific Coast forestry pioneering venture, even though the present seventy members and volume of business may not compare with the record of longer established cooperatives in the East and South.

The success of cooperatives depends on capable management and the Snohomish organization owes its aggressiveness to hustling, energetic farmer-manager Les Sims, a former logger. With Sims supervising woods operations and district foresters preparing management data, progress has been steady.

Sims' initial job was assembling marketing data on outlets from Bellingham to Tacoma, and he has done considerable missionary work in making and sustaining contacts with furniture factories, mill and piling operators, pulp mills and specialty plants, so that these wood-using industries now are cognizant of the co-op's dependable and organized marketing facilities.

From May, 1940, to December 31, 1941, the association did a gross business of \$35,497, with a net income of \$513. Gross sales in 1942 will approximate \$45,000, derived largely from the marketing of 2,000,000 board feet of sawlogs, 24,000 lineal feet of piling and 450 cords of pulpwood.

In 1940 the manager negotiated a sale for 12,000 Douglas fir telephone poles and some piling and car stakes, the first big order given the new organization. Members did their own cutting, yarding and woods work and two members handled the hauling. Material removed came out as thinnings marked by foresters from the Snohomish CCC camp and a thrifty residual stand was retained, with plenty of lusty "crop" trees to mature into more valuable products. Each member contributed his share of the pool according to the allowable sustained yield cut calculated for his woods.

In lend-lease 1941 the co-op made approximately \$25,000 worth of sales in piling, sawlogs, pulpwood, fuelwood and poles. The distant tramping of the European war lords had started to shake American lives. Industry, beginning to produce materials for our allies, required more labor. The resulting exodus to defense centers affected some farms and resulted in the inability of members to work in the woods as much as formerly.

An interesting analysis was made in 1941 of operations on thirty farms,

aggregating a gross business of some \$16,000. The cost distribution on these sales showed fifteen percent going for stumpage, forty-three percent for yarding, loading and hauling, thirty percent for manufacturing (felling, bucking, peeling, splitting), eight percent for profit and almost five percent for miscellaneous costs. The distribution varied according to the type of product cut, but proved a fact long stressed by foresters, namely, that the real return from a farm woods lies in the wages the operator can earn by doing his own work.

In the war-year 1942, fewer farmers worked in their own woods or on other members' lands, because the farm labor shortage was critical. The need for piling was acute and specifications were loosened so much by contractors that considerable farm woods material had a ready market.

Today Manager Sims has plenty of buyers offering tempting prices and the co-op's chief function is to provide members a square deal instead of finding them markets. Financial maturity of timber is now a strong consideration in making sales, because a stand silviculturally ripe in 1953 actually may have a higher value at today's prices, considering the ten-year increment and probable sawlog prices in a decade. Low-grade material is being taken out as thinnings and is finding a good market. Uncle Sam's need for wood means everything marketable should go to market, provided proper harvesting and management principles are followed. The co-op is recommending that smaller owners defer cutting until their own labor can be utilized in the work.

The cooperative is striving to leave harvested areas receptive to reproduction. Ordinarily effected by clear-cutting in blocks or strips or by leaving enough seed trees, this sometimes requires logging precautions to protect residual stands as in a recent co-op sale where the logging operator was required to put fifty cents a thousand board feet in escrow, the total deposit to be returned to him if a predetermined percentage of residual stand stocking was left at the close of the operation. With this financial incentive the operator fulfilled his obligation, and this sale today is proof that devastation need not accompany logging. Fire protection is a major responsibility in today's operations, and slash on harvested areas is being dropped to the ground by close utilization of tops for firewood.

Testimonials from satisfied members are heard frequently. In a recent case one farmer member had been enticed by numerous lump-sum offers for a tract of timber and land he had purchased for \$1,500 in 1925, as an investment. Dur-

ing the intervening years he had realized \$859 from selective cuttings, about \$300 of which was through the cooperative. Eighteen acres of the woodland was about seventy years old in 1942 and carried a fine stand of piling. For this tract, the farmer had received lump sum offers starting at \$900 in 1939 and ending at \$2,000 in late 1942.

District foresters had cruised the stand and knew its merchantable volume to be worth more than that amount. Through Manager Sims, the co-op found a buyer who is taking the piling on a scaled basis, and the net return to the farmer probably will approximate \$3,000. A timber sale agreement specifying cutting methods, tree marking and other treatment assures the farmer of a future crop, and his adjacent younger stands will be protected during the logging operations.

Manager Sims and district foresters expect new challenges in the post-war years. They are anticipating the time when cellulose forestry on short rotations can be practiced on the remaining 325,000 acres of farm-forest adapted land in the western part of the county. An average annual growth of 500 board feet an acre is conservative for this site class and markets and roads are convenient.

Scattered holdings of public-owned lands offer an opportunity for blocking out farm management units. Forests on some of these unmanaged lands can be made to play an important part in county and community welfare. The post-war years also should provide an opportunity to reforest large areas of non-restocked cutover public lands which may provide labor outlets for co-op members.

More emphasis will be placed on refinements in management of second-growth stands. Pruning the lower eighteen feet of young crop trees, developing intensity and type of adapted improvement thinnings, varying clear-cutting and selective cutting methods to suit stands and topography, refining slash disposal methods to obviate broadcast burning, finding markets for logging slash—all to be full time activities.

Today the Washington Forest Products Cooperative and the Soil Conservation district have increased the interest of farmers in their woodlands and have divorced the clearing instinct from many minds by proving that trees are a harvestable agricultural crop. Current operations are proof that a managed farm woods will more than pay its keep and that land resources need not be squandered when the wood crop is harvested. The co-op and the district expect to go all-out in the post-war years, when the junior forests of today will be mobilized to build a new world.

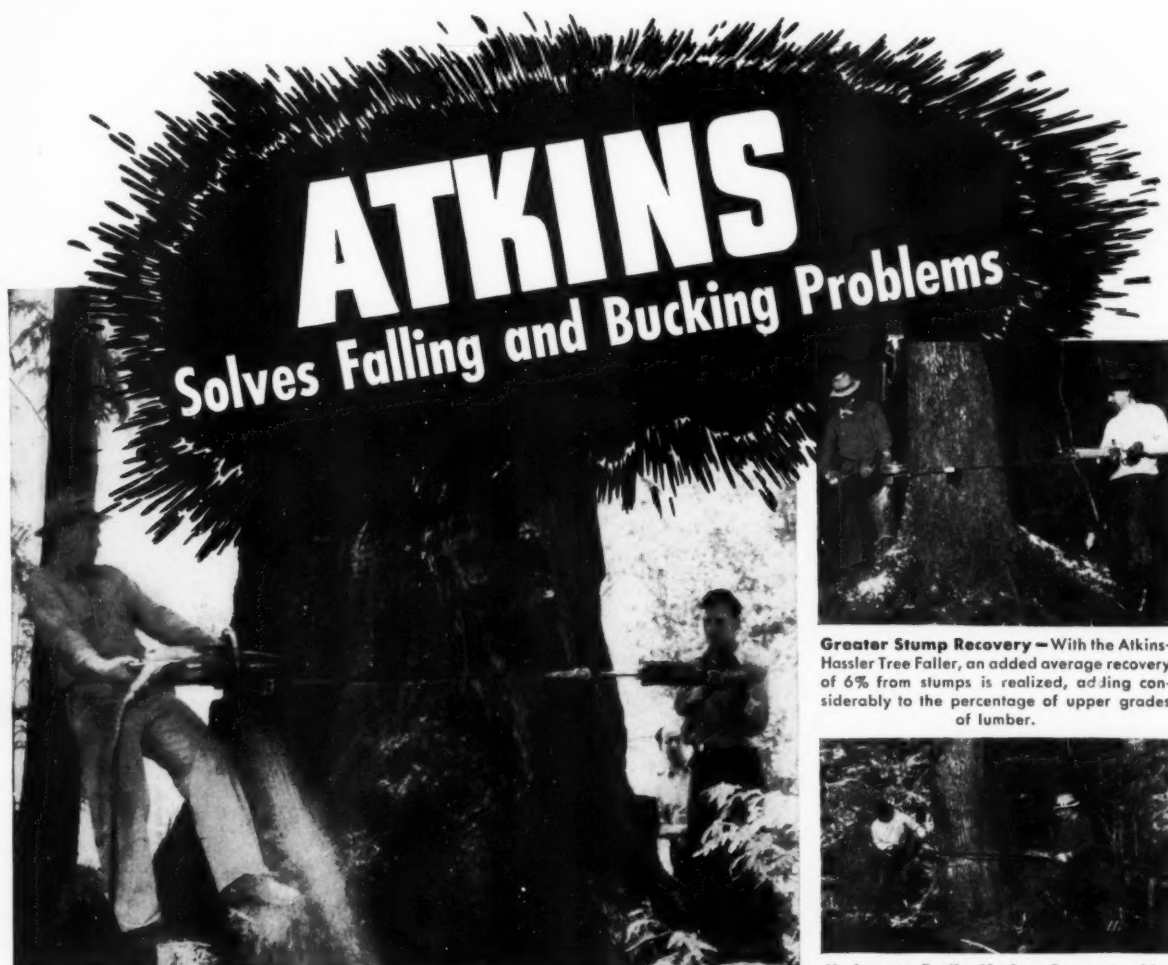
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ROADS FOR WAR TIMBER

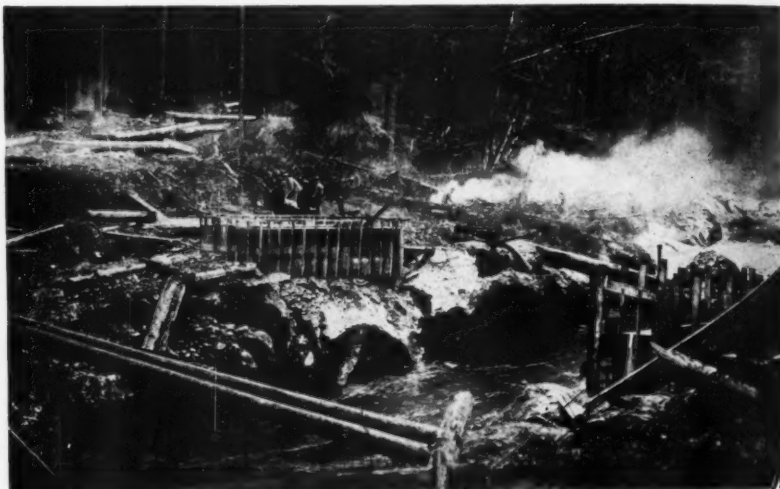
By RAYMOND F. GREFE

THE past fifteen years' experience on the part of the United States Forest Service in building, improving and maintaining forest roads into remote areas of rough and difficult terrain have stood that organization in good stead during the past year. Due to heavy war demand for logs and lumber, new roads into timber stands in all sections of the Pacific Northwest have been extended, old roads improved and existing roads maintained.

Heretofore inaccessible Sitka spruce from the Hoh, Snahapish and Queets watersheds of the Olympic Peninsula, Washington, now is going into the construction of aircraft. Noble fir from the

way of its own. Only three conditions were allowed to shut down a project: namely, ground frozen too hard and too deep to operate equipment, snow so deep it could not be moved, or lack of men to keep the job running.

Nine road projects have been completed or will be completed during 1943 by the Forest Service in Oregon and Washington. These involve a total of fourteen miles of construction and eighty-six miles of betterment or reconstruction, along with 108 miles of maintenance. Each project has been carefully selected and has been approved by the War Production Board on the basis that its construction will develop an



To tap timber needed for the war effort, Forest Service road builders are blasting their way into remote Northwest forests

Snoqualmie and Columbia national forests in western Washington, and the Mount Hood forest in western Oregon, together with higher grades of hemlock, also started over these roads and is no doubt now helping to carry bombs over Germany and Italy. Ammunition boxes made from ponderosa pine from Oregon's Deschutes and Umatillo forests are in the holds of ships all over the world. Douglas fir from the Clackamas River and Fall Creek is being used for plywood, buildings, landing barges, docks, and a wide variety of military purposes throughout the war zones.

Timber access road work went forward last winter literally in spite of hell and high water. Over much of the West Coast country fourteen inches or more of rain fell in November, and almost as much in December. At higher elevations snow fell to a depth of from three to five feet on road crews and road equipment. Each forest had an Alcan High-

early and substantial increase in log production to meet war needs.

Practically all of these roads are of necessity on permanent location and suited to permanent usage. They are largely single lane roads but have inter-visible turnouts ample in size to accommodate logging trucks. Adverse grades have been eliminated where practicable and held down to a minimum where they cannot be avoided. To conserve manpower and materials for the war effort, no work has been done which is not absolutely necessary to serve the immediate need. Later, after the war, they can be economically widened and improved to meet the permanent needs for sustained yield production from the timber stands which they tap.

The net result is that this work is one hundred percent war effort and at the same time offers an opportunity for almost complete "salvage" and return to peacetime use. The roads, as built, will

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We say "the safe way" because the use of Cummins Diesel power in the woods reduces the fire hazard to the minimum . . . for with a Cummins Diesel providing the power the menace offered by flying sparks or highly volatile fuels is eliminated.

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Today our first duty is the production of logs, lumber, plywood and doors for the war effort. To this end we have devoted all our facilities.

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bring about a very material and immediate addition in this country to the production of airplane stock, plywood and structural lumber. They are aimed at supplying existing mills and in their planning the necessity for additional mill construction has been avoided. Most of them have been "on paper" and planned for a number of years. By setting the construction dates ahead, the forester is doing one more good job in helping to bring the war to a quicker and more effective conclusion.

The Forests' Role in Victory

(From page 209)

their product, had carried death to the enemy and made the promise of victory a bit brighter.

As our ground forces at the front expand, they will need increased amounts of West Coast lumber products. All supplies for the front will have to be stoutly packaged for shipment, and the packing material will be forest products, in the form of wood or paper. Here, also, West Coast lumber has an important part.

At one of the Boeing plants the crating and shipping shop is a factory in itself, using about half a million feet of lumber—mostly Douglas fir and West Coast hemlock—each month, with quantities of new and salvaged plywood. Parts and parts assemblies for offshore shipment are packed in crates three feet wide, three feet deep and seven feet long. Rods and tubes are shipped in boxes twelve to sixteen feet long, twelve to eighteen inches square.

To sum up, the Douglas fir is the world's champion fighting tree. With its companion species, it is providing wood war birds for the United Nations. West Coast lumber is the "flat top" of the carriers. Our shock troops mount their over-the-river attacks on Douglas fir ponton timbers and planks. Douglas fir sails in the new fleets to fight the submarines. The giants fall in the West Coast forests, and are speeded on to battle. They are headed for Tokyo and Berlin.



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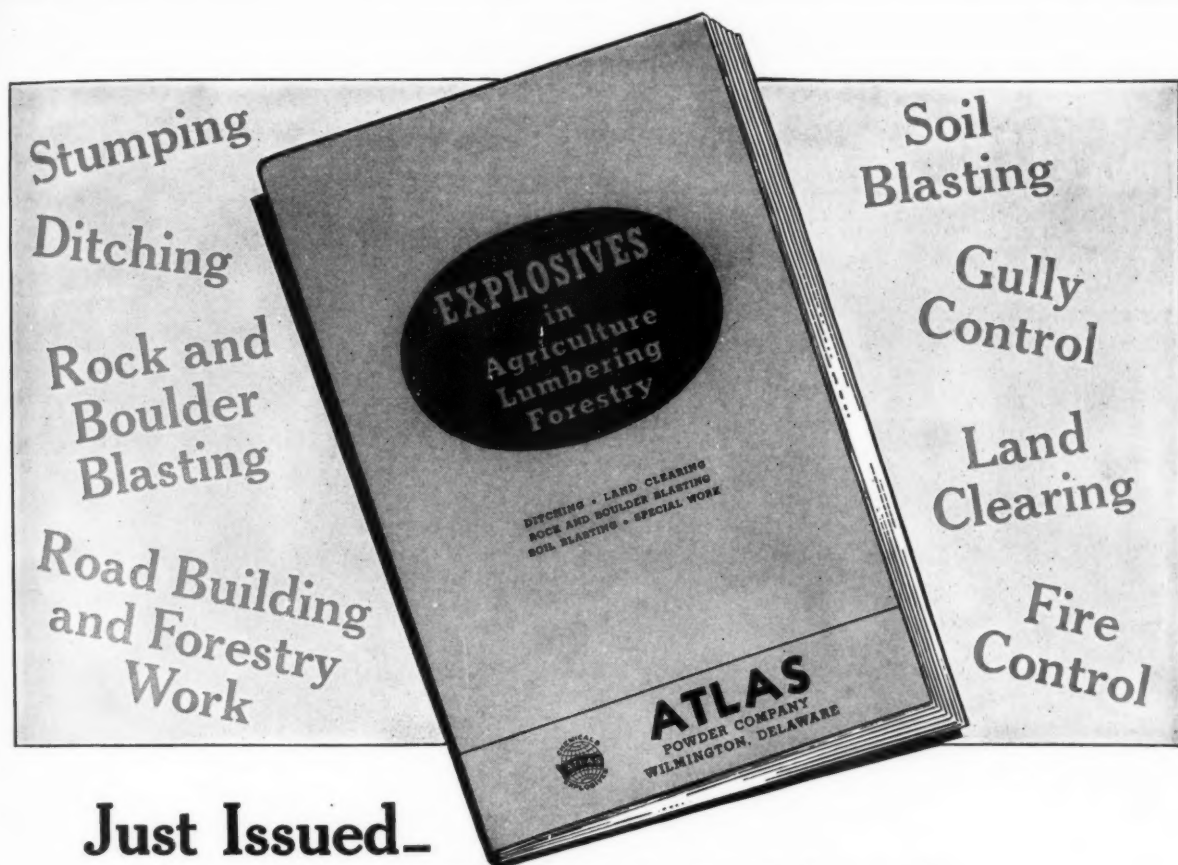


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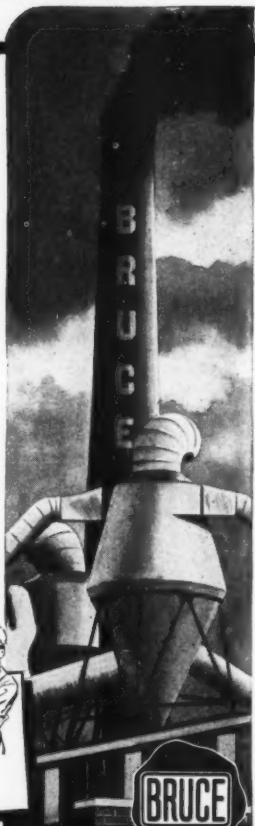
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Tree Farms

(From page 228)

Currently all forest lands of the member companies not bearing old-growth timber are being examined to determine their potential productivity, their current stocking conditions, the nature, density and distribution of forest fuels, and general fitness for the production of forest crops on a commercial scale.

As soon as the basic information essential to long range forest management plans has been assembled, long range planning will be undertaken. The ultimate objective is continued maximum production of merchantable forest products on lands suited to that purpose so that the continued sound and stable economy of the area will be assured.

Enemy Fire!

(From page 234)

January, 1942, representatives of the United States Departments of Agriculture and Interior, of state forestry departments, private forest protective associations and forest industries met at the regional office of the Forest Service in Portland and set up for each state a Forest Defense Council. Each council consisted of five men, representing the two federal departments, the state, the private protection agencies and the forest industries. In each state, the council became the general staff, charged with planning the season's campaign and providing for meeting emergencies with men and equipment. Following a mid-summer meeting at Longview, Washington, a small emergency committee was formed to unite the forces of the two states, in case something should happen demanding that the forces north of the Columbia River come to the aid of those on the south, or vice versa.

Roughly the forest protection plan was to call first upon regular detection and initial striking forces within each patrol district. In operating areas, these were the special camp wardens and logging crews; elsewhere in the forest, they were the wardens, fire guards and special standby crews. Because federal funds were provided for emergency protection of forests and facilities, more special crews were available for use on both private and public land than ever before. Even though the CCC was no more, its loss was offset by these crews.

Thereafter situations would be met by "move-up" of men and equipment from pools and depots and by calling upon logging and sawmill operators for organized crews and heavy machinery, all according to plan.

Ordinarily in time of widespread fire



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peaks, protection agencies rely upon hiring halls for temporary labor. The drying up of such sources in war time impelled the OCD to set up a nation-wide Forest Fire Fighters Service. Begun in 1942, this program for enrolling volunteer fire fighters in cities and villages is expected to supply a Northwest reservoir of man-power for use in case of serious 1943 emergency. However, meth-

ods change. Most protection men are convinced that with well-trained shock-troops available in every district, with loggers' crews and heavy machinery on call, and with farmers prepared to handle field fires, the desperate, indiscriminate hiring of men to wield shovels on the fire line will rarely be necessary. Nevertheless, the FFFS, like the Green Guard, is good catastrophe insurance.

Public Interest in the Douglas Fir Region

(From page 215)

stable type of ownership has been associated with the presence of old-growth, virgin forests. Stable ownership begins to appear when readily available virgin forests become scarcer, and the necessity for and possibility of profit in growing timber begins to become apparent. The Pacific Northwest has been no exception to this rule.

The existing situation is a challenge to the American system of free enterprise. The Pacific Northwest contains the greatest body of virgin forest remaining in the United States. When it is gone the nation's wood supply must come from forests that have grown under man's care and protection rather than from those which have slowly developed over the past centuries. The Pacific Northwest has tremendous areas of readily accessible forest land capable of producing yearly an average of 500 board feet an acre of valuable species of timber. Portions of it can produce as much as 1,000 board feet an acre every year. If private forestry cannot make the grade here, it is difficult to see where it can succeed.

Is private forestry within the region farseeing and ingenious enough to devise systems of financing and management which will meet the public demand for continuous production and show the profit necessary to private enterprise?

It is becoming increasingly apparent that modern warfare demands not merely large quantities of lumber, but a plentiful supply of lumber of special grades. Many of the lumber items now in special demand are those which can only be secured from old-growth forests. The virgin forests of the Pacific Northwest, many of them hundreds of years old, are now supplying much of this material. Once these forests are destroyed, it will take centuries to duplicate them. As an element of our national defense of the future, public reserves of these old-growth forests should be maintained in the Pacific Northwest. Such reserves should be carefully husbanded and protected. Some slight cutting might be necessary at occasional intervals. But its purpose should be only to maintain the vigor of the forest and the continuance of the largest possible volume of

high grades of timber from which items of wartime necessity can be secured.

The desirable goals to protect the public interest in the commercial forest lands of the Pacific Northwest can be summarized in a relatively few points. First, these lands must be kept busy growing timber to meet the needs of the nation. This will involve protection and the application of proper silvicultural measures. Second, ownership of these lands must be stable and divided between private interests and the public—the federal government, the states, and all lower levels of government which demonstrate the ability to manage them properly. But competency of long-time management must be the deciding factor in all cases.

There is no reason to believe that the various problems now faced in management of Pacific Northwest forest lands are insolvable. Most of the practices necessary to keep them in permanent production are known, and research can develop the others. Old-growth forests can be replaced gradually with younger stands which make good net growth and which will be cut at a rotation age carefully determined from both silvicultural and economic considerations. Much of the waste now so common in the woods and mills, and associated with the harvesting of old-growth timber, can be eliminated. Private ownership can be stabilized to a much greater degree than now, in the hands of individuals or concerns primarily interested in long-time, sustained yield management. Obviously, it will exist only on lands which can yield a profit from such management. There can be continuous production of Douglas-fir, hemlock, cedar, spruce, and other woods which will provide permanent pay rolls and profits to the region and will meet a permanent national need. Technological developments will demonstrate new uses for wood, which the industry must be alert to apply. Increased population and continued development of hydro-electric power can result in expansion of end product fabrication and manufacture. Permanent, profitable industry and protection of all the values of the forest will result from recognition of the public interest.

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Industry Starts a Forest Nursery

(From page 227)

and prepare them for transplanting on
burned forest acres.

The nursery site was selected only
after some 400 test borings of the soil
had shown it to be highly suitable for
the purpose. Then the ground was
plowed and harrowed, two miles of tile
were laid in the sub-soil for drainage,
an artesian well drilled and this and a
pump were connected to three miles of
overhead pipe line for sprinkling.

The seed stocks were selected after
long tests by Charles Reynolds, super-
intendent, a forester who for a decade
past has made the growing of trees from
scratch his only work. To begin with,
Reynolds and a crew went into a part of
the great old West Coast forest where
trees are especially noted for their vigor
and freedom from all of the many dis-
eases and parasites that attack forests.
They collected cones which were dried
in kilns, and threshed of their seeds.

Now began months of tests with seeds
and soils and seed-soil combinations.
Cans of soil from the nursery site were
mixed with this or that chemical—cal-
cium, potash, manganese—and placed in
a room maintained at summer tempera-
ture. Each can, when planted with
seeds, was surrounded by electric soil
heating cables, which kept the earth
warm. Artificial lights were operated
certain hours every day to simulate sun-
light in the dark rainy winter of the
Northwest. This process amounts to
selective breeding, for only the seeds
which responded best were selected for
planting. The process also determines
the best types and amounts of minerals
to be added to the nursery soil.

When planting time came, the first of
Superintendent Reynolds' revolutionary
machines went into action. This is the
gasser. It looks like a double-barreled
piece of field artillery, and is pulled by

a tractor and operated by men wearing
regulation Army gas masks. Through
five small pipes this machine pumps tear
gas (chloropicrin) into the soil, six
inches beneath the surface.

As soon as the machine finishes one
bed, the overhead sprinkling system is
turned on and the ground given a good
wetting. Tear gas is insoluble in water.
The sprinkling thus seals the gas into
the ground where it is left for three days.
Then the ground is aerated by cultiva-
tion. The gas kills all weed roots and
many but not all of the weed seeds.

Actual planting came next. A ma-
chine drill moved along at twelve miles
an hour, placing Douglas fir seeds three-
eighths of an inch deep, Port Orford
cedar and Sitka spruce seeds one-eighth
of an inch deep. To keep the machine
drill in perfect line, Superintendent
Reynolds devised a novel method of
markers. Set in blocks of cement in
straight lines and at suitable intervals
are short pieces of wire rope. As the
machine rolls along, hewing straight to
the line, the anchored cables will give,
flop over, when struck by the treads and
wheels, but will become erect again when
the machine has passed by. They thus
are permanent markers to guide the men
operating not only the drill, but also the
weeder and other machinery used.

Throughout the summer and fall the
young trees are watched as closely as so
many children. Up and down the beds,
sitting on specially built low-platformed
buggies, women weed and thin the seed-
lings. A sharp lookout is kept for moles,
for these tiny animals can quickly wreck
a bed of thousands of trees. The weath-
er is watched also. If a frost appears
likely, the watering system is turned on
all night. Falling water will prevent the
tender shoots from being nipped.

If, in July and August, a mild drought
comes on, water is used not only to pro-
tect the trees but also to toughen them.
"We do this so they can withstand al-
most any drought conditions when they
are planted in the woods," Reynolds
says. "We do it by letting the soil in
the beds dry out until the trees are al-
most ready to wilt. Then we give the
soil a good soaking. We repeat this pro-
cess all summer. By subjecting the plant
to short droughts we force it to build up
an internal structure able to withstand
drought in the field." This toughening
process calls for scientific care; samples
of the soil are constantly being taken to
the nursery's well equipped laboratory
and the moisture content measured, for
if the soil was permitted to remain dry
only an hour or so too long, the trees
would die or at least would be weak-



BUY WAR BONDS AND STAMPS REGULARLY

ened rather than strengthened against drought.

The overhead sprinkling system has another use. Into the water that feeds it go various chemicals for spraying to prevent growth of fungi and to kill bugs.

Although the tear gas will have killed most of the weeds, thousands will survive and begin to show their heads early in the growing season. At periods, as needed, men armed with flaming torches walk along the beds, brushing weed growth with fire. Between the beds mechanical weederers are constantly at work.

Harvest time—December and January—is when the nursery is most like a factory. If the ground isn't damp enough, it is given a wetting. The soil is then loosened by a machine made expressly for that purpose—a giant steel blade, pulled by a tractor and regulated by a man who walks along to watch the process closely.

Following the loosening machine are two men who pick up the little trees, now five inches tall and with a root system even longer, shake the dirt from the roots, and place them quickly in rows between damp burlap in the tree buggy they push ahead of them. When the buggy is loaded, a tractor pulls it into the warehouse. And now begins a real factory production-line, perhaps the first ever applied to handling nursery stock.

The crates of trees are taken from the buggy and set at the head of a long sorting table, the top face of which is a moving belt. The belt is marked off into intervals, and into measurements, the latter to indicate the minimum root- and top-lengths permissible for perfect stock.

Two girls place the trees at regular intervals on the moving belt, at the rate of one tree a girl per second. On down the line they go, at about fifteen miles an hour. Near the foot of the table a girl inspects all the trees, pulling off any that are too small, sickly, or otherwise not up to the high standard set. At the same time she pulls off a tree, this girl flips up a counter tab on the edge of the belt, so that no cull is counted. The counting mechanism is automatic; when one hundred trees have passed inspection and fallen into a compartment at the end of the table, the machinery clicks and an empty compartment comes into place as the full one moves away.

The trees are taken from the compartments, their roots wrapped in wet sphagnum moss and parchment paper—and there you have a neat bundle of exactly one hundred perfect seedlings. The bundles are next packed into crates, 6,000 trees to a crate, and will keep for weeks without suffering injury, or damage from shipping. In this form they are taken to the hills for transplanting.

From the time the small trees are

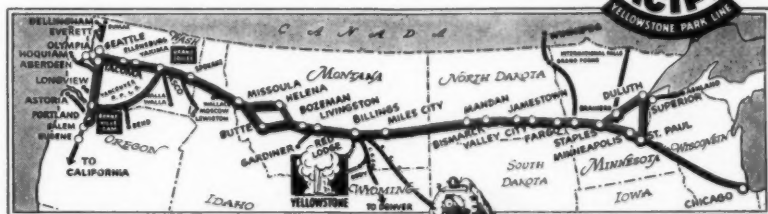


Recipe for a glider:

“SELECT logs as needed, peel into sheets, place crosswise, press together, sand and cut into sheets of plywood. Next, place plywood on glider-form, bake, allow to harden, remove” . . .

There, roughly, you have the “recipe” Uncle Sam now uses to make gliders for our Air Forces. For one kind of plywood—Douglas Fir—Uncle Sam depends largely on manufacturers in Washington and Oregon. From these States comes 85% of the plywood made in this country—for gliders, trainers, transports, barracks, torpedo boats, pontoon bridges and many other wartime jobs.

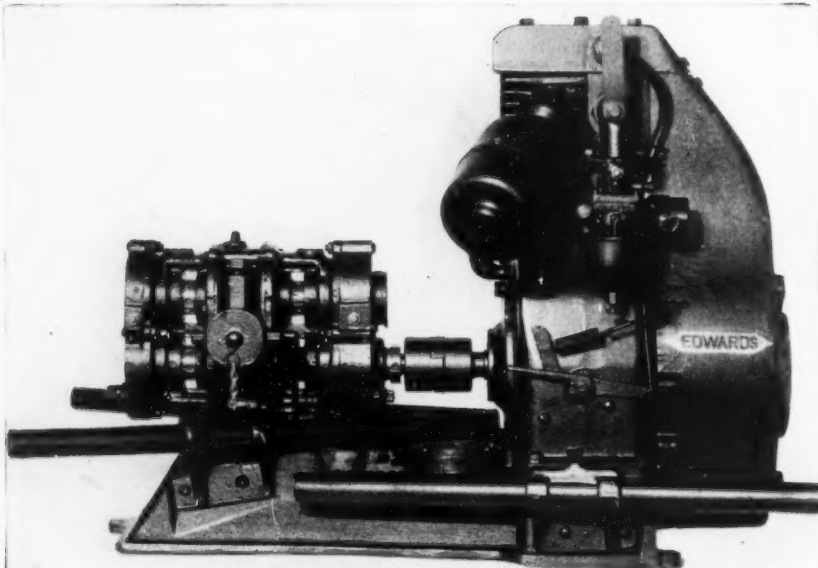
When war came to America, plywood plants, like many other vital industries in the Northwest, found Northern Pacific Railway well equipped to handle the extra load. Even before Pearl Harbor, thousands of tons of plywood were rolling east to manufacturing centers via the “Main Street of the Northwest.”



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lifted from the ground until they are packed in damp moss, speed is of the greatest importance. "Every minute that a young tree's roots are exposed to air and light is bad for it," Superintendent Reynolds says. "That is why we have speeded up the process so that now the roots are exposed, during the entire operation, for less than a minute.

Transplanting the trees to burned-over areas in the forest goes on from December to April. The average planting is 500 trees to the acre, set eight feet apart. Of 500 trees thus planted, a few will be eaten by mountain beaver, small rodents about the size of rats and with even larger appetites. A few more will wilt and die, but this loss is certain to be small with Nisqually stock because of the careful selection of seeds, the nurture of the young plants, the toughening process and the culling of imperfect trees during harvesting and packing. The rest will grow strong and tall—likely taller than Bunker Hill Monument, which is a mere 220 feet high.

Labor

(From page 231)

suggestion to relax existing safeguards and throw open the forests to indiscriminate, if speedy, cutting. He knows only too well that his home, his job and his usefulness as a citizen are at stake.

No group of citizens is more concerned with keeping fire out of the woods than the loggers. Although thousands upon thousands of them spend eight hours a day in the woods during the summer months, they and the industry they work in are responsible for only a very small percentage of forest fires.

Gradually there is coming to the Northwest lumber worker a realization that the post-war era will be an era of wood, an era in which a thousand articles formerly made of steel, copper and aluminum will be made of wood; an era in which wood plastics will dominate many manufacturing processes. The realization is coming also that every bomb falling today in Europe, Asia, or Africa is creating lumber orders for some future date. Therefore, the Northwest lumber worker is anxious to perpetuate the timber resources of his area in order that he may be ready to play his part in the rebuilding of the world. His own interest, as well as the interest of his state and the nation, demand it. That is why the Northwest lumber worker will be found in the forefront of any movement having as its objective preservation and extension of existing forest resources.

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The government has authorized Fruehauf to produce light, medium and heavy-duty logging Trailers—both single axle and tandem axle types. Available for immediate delivery through Fruehauf Branches to anyone with a Certificate of Transfer PD—321. See your Fruehauf Branch for assistance in filing for a Certificate.

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Many and mighty were the fabulous feats of Paul Bunyan and Babe, his famous blue ox. Together they made history that will never be forgotten as long as loggers gather for bunk house "bull sessions."

But now, Paul's prowess is really challenged, and Babe's records are finally broken—by the complete and successful war effort of the entire logging industry.

Under adverse conditions and against heavy odds, more and more lumber moves

out of the Northwest every month. Wood in ships and planes moves our armed forces to foreign fronts—lumber builds better housing wherever they are quartered—timber has dozens of essential jobs in the growing war program.

Modern equipment has its part in the records of which the lumber industry can be so justly proud. Fruehauf, too, is proud of its contribution to more efficient logging.

A limited number of new Fruehauf Logging Trailers are now available for immediate delivery to logging operators who have a Certificate of Transfer (PD-321). Fruehauf Branches will also advise operators regarding use of application form, PD-310, for obtaining such a certificate.

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Forests of the Douglas Fir Region

(From page 205)

Since 1933, protection against fire, logging practices and timber utilization have improved greatly so that it is fair to say that when the mature forests of the region are cut and replaced by young, fast-growing forests, the gap between growth and drain will not be great if the normal cut of the future remains around eight billion feet yearly. People from the Douglas fir belt do not exaggerate the way their forests grow. They do not have to because here again they have the official figures to support them. A well stocked acre, for example, of sixty year old Douglas fir growing on the better land should have 72,800 board feet on it. If one thinks in terms of pulpwood, this same acre would yield eighty-five cords. That indicates what young forests on the better lands can and are doing in the way of growth.

From its beginning lumbering on private lands in the region has followed pretty much the typical American pattern. First it proceeded under the philosophy of forest inexhaustibility. Then came the era of forest liquidation during which private owners thought mainly of converting their timber into money as quickly and as advantageously as possible. While forest liquidation is still going on, there has in recent years been a notable swing particularly on the part of the larger owners to place their forest properties on a permanently productive basis in order to perpetuate the forest resource.

Appreciation of the region's ability to grow new forests rapidly and

unfolding opportunities for increased utilization of wood, present and prospective, have brought about a change in the point of view of many forest land owners. This is reflected by the growing area of managed forests, to which the lumbermen have given the name "tree farms" and which now approximate two million acres. An additional five million acres of cut-over land, privately owned, are covered with "junior forests"; and probably three-fourths of the current logging observes the industry's code of reseedling practices.

The Lumber Code in 1933 provided for seed supply and care of young stands. The lumbermen have continued it on a voluntary basis, wherever they did not get it enacted into state law. Oregon's snag-falling law and conservation act are examples. The revolution in woods practice made by truck and tractor logging has brought some difficulties, but the logged lands unquestionably look better than they did. The old complaint that material not merchantable at the time it was knocked down and burned, is replaced by the new complaint that this same material is left standing and occupies ground that should be cleared for young trees. This is often more or less true, but it is not always a total loss.

Pulp production grew from 800,000 tons to 1.9 million tons in the past decade. Plywood production has quadrupled in that period. Sawmill practice in the production centers has changed. The old-time waste burner is seldom seen around the larger towns. The fuel that fed them goes to the pulp mills, to re-manufacturing plants, or is built up into merchantable products at the mill. The sawmill is not necessarily the main center of activity. It is still there, but the substantial paper mill and the plywood plant are equally conspicuous.

There is still in the region plenty of poor lumbering but twenty-six million acres of land cannot be changed overnight from wild to managed forests. Nevertheless change is in progress at an increasing rate, particularly on the most productive and most accessible lands where economic conditions cushion some of the difficulties. Last year private owners were employing fifty-five professional foresters for forest management work in the woods. Another ninety were engaged in forest research and production. More and more the private owners and the region as a whole are awakening to the fact that timber cropping in the Douglas fir region as a private enterprise offers a sound and profitable long-time business.

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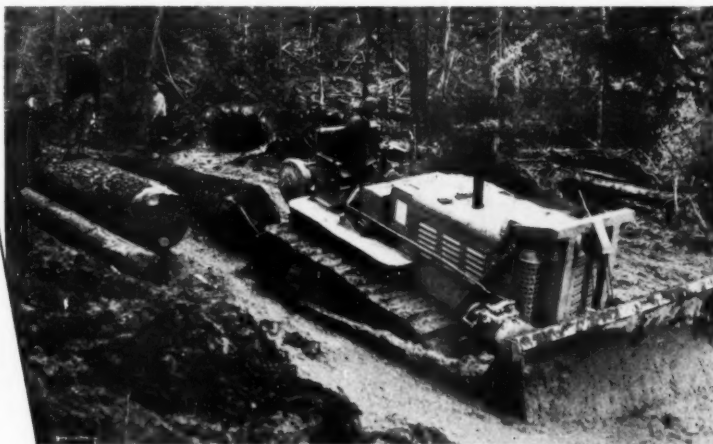
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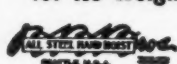
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Redington Named Manager of AFA Project

John C. Redington, of Wilton, Connecticut, business and research specialist, has joined the staff of The American Forestry Association as business manager of its Forest Study Project, formally adopted by the Board of Directors last November to appraise the forest situation as affected by the war.

With more than a quarter-century experience in business research and management, much of it in the pulp and paper field, Mr. Redington is particularly well qualified for his new assignment. He has long been interested in forestry and related conservation fields.

His twin brother, the late Paul G. Redington, was chief of the Biological Survey from 1927 to 1934, and for twenty years associated with the United States Forest Service.

Mr. Redington is a native of Illinois and a graduate of Dartmouth College, where he received an AB degree. During World War I he was a captain of artillery with the famous Rainbow Division, serving eighteen months with the AEF and the Army of Occupation. For meritorious service, he was awarded the Silver Star Medal and six stars on the Liberty Medal.

Industrial Forestry Meets the Shock of War

(From page 212)

maximum production, should force the occasional relaxing of customary forest practices. Less snags have been fallen in a few operations, because the diminished crews of fallers were needed more urgently to drop sawtimber. In a few instances—fortunately only a few—the same shortage of manpower and drive for production have resulted in less attention to leaving seed trees or seed blocks, some letting up in the momentum of the industry's forest program.

The industry as a whole is more fire conscious than ever before. Fire precautions, fighting equipment, patrols, observance of bad weather warnings—all have a keener edge. A concerted drive was made last fall to clean up accumulations of unburned slash. The very shortage of men has put most op-

erations on their toes to prevent the start of fires. Here is a real gain from war.

Also on the credit side is the closer use of low-grade logs—beyond anything yet known in West Coast camps; and the strides in wood fabrication and use. The war has put over "engineered" construction with ring connectors and glued lamination. This all encourages the business of growing trees.

As far as can now be foreseen, the total effect of the war upon the Douglas fir forest will be slight. In charts of timber depletion and restocking it is doubtful whether the period of World War II will leave much trace. The progress of the industry in timber cropping and long-range forest management will be neither stopped nor blunted. The effect of the war upon timber values and utilization and upon tighter fire control may indeed speed up the change.

One large *if* must be coupled with this forecast,—*if* the Douglas fir forest can be carried through the war without serious fire wreckage from sabotage or air attack. West Coast loggers and fire wardens cherish no illusions of forest safety from the marvelous fire record of last year or the failure of the pitiful attempt of a Japanese plane to set the forests afire. The dry, hot spells of a more normal summer may bring an attempt to destroy old and young forest alike on a scale never approached in West Coast experience.

Every group concerned with forest protection in the Pacific Northwest—federal, state and private—has the full measure of this danger. Last year it brought to the region a degree of preparation and unity of command never before experienced. The entire industry was mobilized under agreements to furnish men and equipment on call. Even more, the hazard marshaled behind the protection forces a public understand-

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wards their government, have done more perhaps than any other one activity to make this a nation united and indivisible.

One truly representative American railroad is the far-flung, 11,000-mile Milwaukee Road—with bands of shining steel linking the industrial ports of the Great Lakes to the world ports of the Pacific North Coast. This railroad is proud of the productive region it serves and proud to be a part of America's free railroad system.

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**YOUR WAR BONDS
WILL
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ing and support never before attained. Both the incendiary fire and the careless roadside fire practically disappeared. The Northwest to a man supported the sheriff who announced that he would

shoot a fire-bug on sight, and try him afterwards.

Barring the big if, the war may greatly aid Douglas fir forestry to overcome its worst enemy—the man-caused fire.

After Victory—What?

(From page 238)

which the staves are horizontally, instead of vertically, disposed.

Highway bridges of pre-framed material treated with preservatives and designed to carry the pavement on the treated decks have proved to be so satisfactory that their use on an expanded scale can be predicted. Wood pipe and wood culverts, which do not require the use of material of large dimensions, have been improved in design, and in many industrial plants such material, properly treated with preservatives, had begun to replace metal even before war demands caused a restriction of the supply of steel.

Even big timbers have been improved. The use of "chemical seasoning," developed by the Forest Products Laboratory and the West Coast Lumbermen's Association, in which the surface of the wood is treated with urea, a hygroscopic substance, minimizes checking to a substantial degree. Big timbers from this region will in the future be better timbers—although the price will be higher.

Much has been said about the "waste" resulting from logging and milling in the Douglas fir area. A great deal of this wood is, however, consumed as fuel.

Douglas fir "hog-fuel" and sawdust have calorific values of over 5,000 B. T. U.'s a pound when green, and leave less than one percent of ash when burned. Dry sawdust and planing mill shavings, now compressed into log-like briquettes under pressures as high as 50,000 pounds a square inch in a patented machine controlled by the largest manufacturer of lumber in this region, are now a standard commercial fuel. The wood in such briquettes contains well over 8,000 B. T. U.'s a pound.

Many a resident on the Atlantic Seaboard would be glad to pay a substantial price for such "waste"—if he could get it! These "pres-to-logs" are now being destructively distilled in large quantities for the production of the activated charcoal that is needed for national defense. After victory, production will probably continue on at least a limited scale, for it is rumored that even the rawest rye can be converted to "bottled in bond" stuff by treatment with this charcoal.

Studies made by the College of Forestry, University of Washington, indicate that virtually all of the pulp mills of the country could be supplied with pulpwood if economic conditions and the availability of labor would permit the harvesting of logging "waste." In the future, this unutilized material will prove to be a valuable reservoir of basic raw material of primary importance, and the possibility of its intensive utilization is today being studied in many laboratories. One of the large pulp manufacturing concerns has drawn plans for a new mill that will operate on forest waste, to be erected after the war emergency passes. Special machinery, involving a portable "wood room" that can be moved from point to point in logged-off areas has been designed at the University of Washington and the fact demonstrated that a very satisfactory grade of insulation pulp can be made from logging waste. A cellulose and lignin research laboratory in which basic research on these substances is conducted is in operation at the same university.

At Longview, Washington, a large and well equipped laboratory for general

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BUY WAR BONDS AND STAMPS REGULARLY

commercial research in forest products has been established by the Weyerhaeuser Timber Company in addition to its long-established pulp and paper research laboratory at that same plant. At Camas, Washington, the Crown Zellerbach Company, a large consumer of timber, maintains a central research laboratory, and at Shelton, Washington, at the plant of Rayonier, Inc., an affiliated concern, is another large and important research laboratory. Other independently organized laboratories are likewise engaged in research on wood products. All this augurs well for the future.

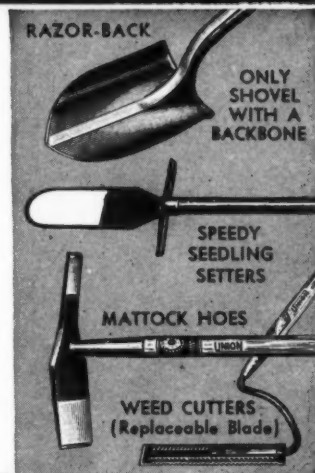
But lumber, as such, will continue as the backbone of the forest products industries for a long time to come. The manufacture of by-products, such as alcohol, cork, tannin extract, vanillin from waste sulfite liquor and other products will be incidental. The lumber industry will have to pay the cost of reforestation, so that the other industries can continue. And small, rapidly growing timber is reaching commercial size all over the logged-off areas where virgin timber stood a few short years ago. The big factor that will make this timber so valuable in the near future is not a mere matter of volume growth or growth in diameter. The small, "peewee" logs

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WILL BEAT THE ENEMY!**

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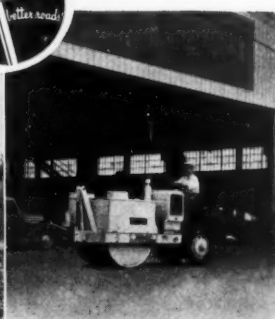
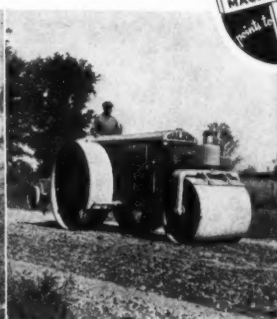
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Unless Americans do something about it, 200,000 fires will this year destroy timber equal in volume to the wood required in the building of 20,000 Liberty ships, or 2,000,000 Army truck bodies. These fires will consume around 2,000,000,000 board feet of merchantable timber—wood desperately needed to keep our war plants operating at full capacity and to keep our fighting men supplied with food and arms.

Remember—this did happen last year. It has been happening every year since man took over the stewardship of the land. It can happen this year unless Americans realize that they can't win with forest fires—and mobilize against them with conviction and determination.

These stamps will help spread the message of forest fire prevention. Each stamp beautifully printed in 4-colors. Available in sheets of 100 at \$1 a sheet. They are ideal for use on letterheads and envelopes, and each sheet used will mean that 100 individuals have been appealed to directly in the immediate fight to "stop forest fires before they start." Send your order today to—

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FORTY YEARS OF PRIVATE PROTECTION

The first forest patrol in Oregon was organized in 1904, by private timber owners. Under general supervision of the State Board of Forestry and in collaboration with State and Federal agencies, local private protective associations still carry on — protecting forests — old and new — from their worst enemy, fire.



Clackamas-Marion Counties Fire Patrol Association

Coos County Fire Patrol Association

Douglas Forest Protective Association

Eastern Lane County Fire Patrol Association

Lincoln County Fire Patrol Association

Linn County Fire Patrol Association

North West Oregon Forest Protective Association

Polk County Fire Patrol Association

Walker Range Patrol Association

Western Lane Forest Protective Association

affiliated in the

Oregon Forest Fire Association

Portland, Oregon

will make long lumber, for this is the land of tall timber. It is the exceedingly rapid height-growth of the trees that makes forestry such a sure-fire proposition for the future of the Northwest. The research laboratories really have "something to work on," here!

David Douglas

(From page 221)

a tremendous tree south of there, and this trail eventually led to the discovery of the sugar pine, which Douglas named *Pinus lambertiana*. After months of contact, he overcame partially the hostility of the Indians and even gained a measure of help from them, though they were never wholly to be trusted.

Many times, physically exhausted, his spirit was borne down by his many misfortunes, chiefly the loss of specimens collected under the utmost difficulties and carried hundreds of miles. Once in the Northwest his canoe was dashed to pieces and his whole equipment and more than four hundred specimens were lost. Again, an eagle which he had carried two thousand miles to Hudson Bay and was about to ship to England, died. "What can give more pain?" Douglas wearily wrote in his diary. He was later, however, to know even greater depths of despondency before his return to England in 1827, with his large and valuable collection—fruit of tireless endeavor. It was then that the Douglas fir was reintroduced into England.

In the New World he had sorely missed his contact with men of his own kind and similar interests, which he had only been able to keep up through meagre correspondence. But after two years at home, he again set sail for the Columbia country. Hostile tribal warfare, however, made a lengthy stay there at that time impossible and so, still enthusiastically collecting, he went on to California, then South to Rio and the Sandwich Islands. Going to Hawaii, in 1833, he met—in July of the next year—his appalling death. He fell by accident, when alone, into a bullock pit, or trap, into which the natives lured wild cattle. This tragic event was fully described in this magazine for June 1942 in "Kalu-akauka—The Doctor's Pit."

So ended the life of this intrepid Scot—a man born in obscurity whose star of destiny was to lead him to the continents of a new world. His work as a naturalist has written the name of David Douglas in shining letters on the scroll of science, but his ever-living memorial stands on the slopes of the Pacific Northwest—millions of stately conifers—soaring green spires of Douglas fir.

CREDIT FOR PHOTOGRAPHS

Credit for photographs appearing in this issue is acknowledged as follows:

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WHO'S WHO

Among the Authors in this Issue

E. H. MACDANIELS (*Forests of the Douglas Fir Region*), veteran forester, was born in Ohio—Yale Forest School '09—entered Forest Service at once and was stationed in Northern Pacific region. Is now engaged in a broad appraisal and analysis of the forest situation in the Douglas fir area.

JAMES STEVENS (*The Forests' Role in Victory*)—born in Iowa, has made his career in the big-tree country. Busy at woods work—logging and sawmilling—until World War I. Returned to write, many books—best known as author of Paul Bunyan. His latest book—"Timber" came out in 1942. Mr. Stevens is now Information Director for the West Coast Lumbermen's Association at Seattle.

WILLIAM B. GREELEY (*Industrial Forestry Meets the Shock of War*), distinguished leader in forestry, was born in Oswego, N. Y. University of California 1901—Yale M.F. 1904. Entered Forest Service and went straight up the line, in the West and then East—to Chief Forester in 1920—succeeding Graves. Interim for World War I, 1917-19, when he directed lumber production in France for war use—tremendous job—was decorated by France, Britain and the United States. Col. Greeley is Secretary-Manager of the West Coast Lumbermen's Association.

RODERIC OLZENDAM (*Trees and Men*),—New Englander, former Secretary of the Vermont Forestry Association—saw duty in France in World War I. He entered pulp and paper business in Canada in 1919—has written widely on social legislation, stressing field of lumber industry. Is now Director of Public Relations for the Weyerhaeuser Timber Company.

My Company's Program—A symposium, by DONALD S. DENMAN—a leader in the industry and Vice-President and Director of the Crown-Zellerbach Corporation at Seattle, Washington; J. P. WEYERHAEUSER, JR., progressive-minded and largely responsible for the adoption of the selective logging and sustained yield program of the Weyerhaeuser Timber Company, of which he is Executive Vice-President; C. H. KREIENBAUM—for thirty years prominent in West Coast lumber affairs, is Executive Vice-President of the Simpson Logging Company at Shelton, Washington, and CORYDON WAGNER—from logging camp to Vice-President of the St. Paul and Tacoma Lumber Company

—able young executive and director in many important branches of the industry.

STEWART HOLBROOK (*Industry Starts a Forest Nursery*)—dynamic writer and conservationist—enthusiastic director of successful "Keep Washington Green" campaigns, tells of the co-operative nursery at Nisqually, owned and sponsored by progressive leaders in the lumber industry to speed up production of planting stock.

EDMUND HAYES (*Willamette Tree Farms*) is President of the Row River Lumber Company, Fir Ridge, Oregon. He and his family have been actively identified with the West Coast lumber industry since 1857. Mr. Hayes, enthusiastically active in the organization of the "tree farms," is a vice-president of the National Lumber Manufacturers Association.

STEPHEN N. WYCKOFF (*Public Interest in the Douglas Fir Region*),—Californian, Forest Service executive—active in blister rust in West from 1923 to 1936—since 1938 Director of the United States Pacific Northwest Forest and Range Experiment Station at Portland, Oregon.

ALBERT ARNST (*Snohomish—First Western Farm-Forest Co-Op*),—native Oregonian and Forest Service man, is a blister rust and farm forest specialist—lately engaged in working out the first farmer-established forest products co-operative west of the Mississippi.

PETER TERZICK (*How Labor Views Timber Cropping*),—devotee of forestry and the promotion of advanced forest practices, is the editor of labor's leading western paper, *The Union Register*, of Seattle.

JOHN B. WOODS (*Enemy Fire!*)—first line forester and industrial forest expert, widely known both here and abroad, has been identified with progressive lumber interests in forest fire protection for years. Mr. Woods is Secretary-Manager of the Oregon Forest Fire Association at Portland.

BROR L. GRONDAL (*After Victory—What?*) is professor of forest products and in charge of research in this field at the College of Forestry of the University of Washington for the Washington State Planning Council. Prof. Grondal has been in constant contact for thirty years, as a consultant, with forest products industries firms in the Pacific Northwest.



FOREST FIRES LARGER IN 1942

WASHINGTON, March 2.—(AP)—Acreage burned was almost double normal. The Oregon-Washington region had the most fires—1,089. Twelve of the fires were larger than 300 acres, and 8,438 acres were burned over inside national forests. The greatest area destroyed was in Utah, Nevada, Southern Idaho and Western Wyoming, where 55,372 acres were burned with the 732 fires. This small number of the most big fires, 22 larger than 300 acres in extent, also had in the number of fires—1,040, but only one was larger than 300 acres.

Our Carelessness—
Their Secret Weapon

Let There Be NO Careless Matches (Weapons of Sabotage) — in 1943

REMEMBER THESE RULES:



CIGARETTES, lighted matches, neglected campfires can cause more damage to America's war effort than the biggest bomb. Last year, the carelessness of patriotic, law-abiding citizens like yourself was responsible for more forest and range fires than arsonists, lightning, or any other cause. These forest and range fires sabotaged the war effort by destroying critical materials and draining manpower. This year we mustn't let *Our Carelessness be the Enemy's Secret Weapon*. When you go into the woods, be careful—more careful than ever. Obey the rules illustrated above, and ask others to do so. Solemnly resolve that no thoughtless act of yours shall give "aid and comfort" to the Axis.

Type "Y" Pacific Pumper has *everything* a portable pumper should have to guarantee dependable service under any and all conditions—built-in stamina, ample power, maximum pumping capacity.



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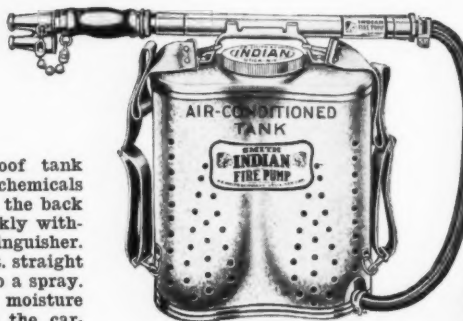
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WILL DO IT—The Forest Service Depends on Civilian Assistance in This Important Work.



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Our Forests Are Vital to Victory!

For many years fires have burned an average of 30 million acres of forest land annually. Many lives have been lost. Damage to the soil, animals, birds and fish has been tremendous. Now we are at war and every blaze helps the enemy. Forest fires—resulting from accident or carelessness—delay Victory and slow down production of material urgently needed by our fighting men. For example a modern battleship requires from 300,000 to 500,000 board feet of lumber. Bombers when packed and shipped take 15,000 board feet and one army cot uses 10 board feet. Will you help in this highly important work? Cut down fire losses and help cut down the length of the war!

THE U. S. Forest Service calls upon citizens in forest areas to wage a campaign to prevent fires and help extinguish them when they break out. Farmers, ranchers, miners, logging crews, vacationists and small town business men are urged to organize fire fighting crews equipped to cope with any emergency. "It does not take much imagination to visualize the tragic possibilities of forest fires at this time," says David P. Godwin, Assistant Chief, Division of Fire Control. Drought-like conditions which have prevailed in some states for the past two years make the danger particularly great.



INDIAN FIRE PUMPS guard the sacred Liberty Bell against fire. Attendants are fully equipped with these great fire fighters in preparation for fires resulting from sabotage, enemy action, accident or natural causes. Thousands of INDIAN FIRE PUMPS are in daily service throughout the United States and abroad.

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